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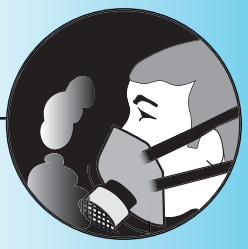

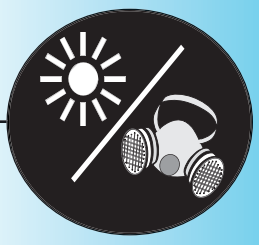

RESPIRATORS

Chapter 296-842 WAC

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Department of LABOR AND INDUSTRIES

Standards Update

Chapter 296-842 WAC, Respirators

Issue Date 4/2007
Effective Date 4/1/2007

The department recently adopted changes to chapter 296-842 WAC, Respirators. In August, OSHA revised its existing Respiratory Protection Standard to add definitions and requirements for Assigned Protection Factors (APFs) and Maximum Use Concentrations (MUCs). We are amending this rule to be consistent with OSHA. We also made additional changes to clarify the language, and fixed some formatting errors. **Please replace chapter 296-842 WAC with the attached.**

To receive future updates of this standard and all other Department of Labor and Industries safety and health standards electronically, please sign up on the WISHA Listserv (**http://www.lni.wa.gov/Safety/Rules/default htm.**). By subscribing to the Listserv, you will also receive rule updates, hearing notices, and informational packets for all safety and health rules.

Also available on the WISHA web site:

- WISHA Core Rules
- Other General WISHA Rules
- Industry and Task-specific Rules
- Proposed rules and hearings
- Newly adopted rules and new rule information
- WISHA Regional Directives (WRDs)
- WISHA Interim Operations and Interpretive Memoranda (WIIM)
- Memoranda of Understanding (MOU)

To receive hardcopy updates of this rule, please return the card located at the back of the book.

Respirators

Chapter 296-842 WAC

Other Rules that may apply to your workplace

- The WISHA Safety and Health Core Rules, Chapter 296-800 WAC, contain the basic requirements that apply to most employers in Washington. They also contain:
  - An Introduction that lists important information you should know, including a section on building, fire and electrical codes.
  - A Resource section that includes a complete list of all WISHA rules and a directory of the Labor and Industries (L&I) offices.
- Other WISHA rules may apply to you, depending on the activities and operations of your workplace. Contact your local L&I office if you're uncertain about which WISHA requirements apply to you.
- To go online to access all the Safety and Health Rules: http://www.lni.wa.gov/wisha
- If you would like to receive e-mail notification of rule updates, please register for the Standards Listserv on the WISHA web site at http://www.lni.wa.gov/home/listservs.htm
- For a CD or paper copy contact us by:

Mail: Department of Labor and Industries
P.O. Box 44620
Olympia, WA 98504-4620

Telephone: 1-800-4BE-SAFE (1-800-423-7233)

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Respirators

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Scope

WAC 296-842-100

This chapter applies to all use of respirators at work.

Important:

Before you decide to use respirators, you're required to evaluate respiratory hazards and implement control methods as outlined in chapter 296-841 WAC, Airborne Contaminants.

The term “respiratory hazards” will be used throughout this chapter to refer to oxygen deficient conditions and harmful airborne hazards.

Definition:

Respirators are a type of personal protective equipment designed to protect the wearer from respiratory hazards.

Reference:

See WAC 296-800-160, Personal protective equipment (PPE) to find requirements for other types of PPE such as eye, hand, and head protection.

-Continued-

Respirators

Chapter 296-842 WAC

Scope

WAC 296-842-100 (Continued)

You can use Table 1 for general guidance on which chapter sections apply to you.

Table 1
Chapter Sections that apply to your workplace

If employees	Then the sections marked with an "X" apply					
	105	110	120	130-210	220	300
Request and are **permitted** to voluntarily use filtering-facepiece respirators, and are not exposed to a respiratory hazard		X				X
Request and are **permitted** to voluntarily use respirators that are **not** filtering-facepiece respirators, and are not exposed to a respiratory hazard	X	X			X	X
Are **required** to use any respirator by WISHA or the employer	X		X	X	X	X
Would use an **escape respirator** in an emergency	X		X	X	X	X

Respirator Program Administrator

Chapter 296-842 WAC

Rule

WAC 296-842-10505

Designate a program administrator

Exemption:

You do not need to designate a program administrator if employees use only filtering-facepiece respirators and do so only as voluntary use.

Definition:

Voluntary use is respirator use that's requested by the employee **and** permitted by the employer when **no** respiratory hazard exists.

Designate a program administrator who has overall responsibility for your program and has sufficient training or experience to oversee program development, coordinate implementation, and conduct required evaluations of program effectiveness outlined in WAC 296-842-12005.

Notes

Voluntary Respirator Use

Chapter 296-842 WAC

Rule

WAC 296-842-110

Voluntary Respirator Use Requirements

Important:

- Respirator use is **not** voluntary if a respiratory hazard, such as exposure to a substance over the permissible exposure limit (PEL) or hazardous exposure to an airborne biological hazard, is present.
- To evaluate respiratory hazards in your workplace, see chapter 296-841 WAC, Respiratory Hazards.
- Some requirements in this section do not apply if only filtering-facepiece respirators are used voluntarily.
- Some filtering-facepiece respirators are equipped with a sorbent layer for absorbing “nuisance” organic vapors. These can be used for voluntary use, but aren’t NIOSH certified for protection against hazardous concentrations of organic vapor.

Voluntary Respirator Use

Chapter 296-842 WAC

Rule

WAC 296-842-11005

Make sure voluntary use of respirators is safe

Definition:

Voluntary use is respirator use that is requested by the employee **and** permitted by the employer when **no** respiratory hazard exists.

Important:

If you choose to require respirator use, use is **not** voluntary and the required use sections of this chapter apply.

(1) Make sure voluntary respirator use does **not**:

(a) Interfere with an employee's ability to work safely, such as restricting necessary vision or radio communication

or

(b) Create health hazards.

Note:

Examples of health hazards include:

- Skin irritation, dermatitis, or other health effects caused by using a dirty respirator
- Illness created by sharing contaminated respirators
- Health effects caused by use of an unsafe air supply, such as carbon monoxide poisoning.

-Continued-

Voluntary Respirator Use

Chapter 296-842 WAC

Rule

WAC 296-842-11005 (Continued)

(2) Provide all voluntary respirator users with the advisory information in Table 2 at no cost to them.

Note:

If you have provided employees with the advisory information required in the previous section, WAC 296-62-07117, you don't need to provide the additional information in Table 2 to those employees.

(3) Develop and maintain a written program that includes the following:

(a) Medical evaluation provisions as specified in WAC 296-842-140.

(b) Procedures to properly clean and disinfect respirators, according to WAC 296-842-22015, if they are reused.

(c) How to properly store respirators, according to WAC 296-842-17010, so that using them doesn't create hazards.

(d) Procedures to make sure there is a safe air supply, according to WAC 296-842-200, when using air-line respirators and SCBAs.

(e) Effective training to ensure respirator use does **not** create a hazard.

Exemption:

If employees use only filtering-facepiece respirators and do so only voluntarily, you don't need to develop and maintain a written program.

Note:

- Pay for medical evaluations, training, travel related costs, and wages. You do **not** need to pay for respirators employees use only voluntarily.
- If you have both voluntary and required respirator users, you may choose to treat voluntary users as required users. Doing this exceeds the requirements in this section.

-Continued-

Voluntary Respirator Use

Chapter 296-842 WAC

Rule

WAC 296-842-11005 (Continued)

(4) Use Table 2 to provide information to employees who voluntarily use any type of respirator.

Table 2
Advisory Information for Employees
Who Voluntarily Use Respirators

- Respirators protect against airborne hazards when properly selected and used. Respirator usage that is required by WISHA or your employer is not voluntary use. With **required use**, your employer will need to provide further training and meet additional requirements in this chapter. WISHA recommends voluntary use of respirators when exposure to substances is below WISHA permissible exposure limits (PELs) because respirators can provide you an additional level of comfort and protection.

- If you choose to voluntarily use a respirator (whether it is provided by you or your employer) be aware that **respirators can create hazards for you**, the user. You can avoid these hazards if you know how to use your respirator properly and how to keep it clean. Take these steps:

  - Read and follow all instructions provided by the manufacturer about use, maintenance (cleaning and care), and warnings regarding the respirator's limitations.

  - Choose respirators that have been certified for use to protect against the substance of concern. The National Institute for Occupational Safety and Health (NIOSH) certifies respirators. If a respirator isn't certified by NIOSH, you have no guarantee that it meets minimum design and performance standards for workplace use.

    - A NIOSH approval label will appear on or in the respirator packaging. It will tell you what protection the respirator provides.

  - Keep track of your respirator so you do not mistakenly use someone else's.

  - Do **not** wear your respirator into:

    - Required use situations when you are only allowed voluntary use.
    - Atmospheres containing hazards that your respirator isn't designed to protect against.

      For example, a respirator designed to filter dust particles will not protect you against solvent vapor, smoke, or oxygen deficiency.

-Continued-

WAC 296-842-11010

Keep voluntary use program records

Exemption:

If employees use only filtering-facepiece respirators voluntarily, you don't need to follow these recordkeeping requirements.

(1) Keep copies of:

(a) Your current written respirator program

(b) Written recommendations from the licensed health care professional (LHCP)

(2) Allow records required by this section to be examined and copied by affected employees and their representatives.

Reference:

See chapter 296-802 WAC, Employee and medical exposure records, for additional requirements that apply to medical records.

Notes

Written Respirator Program and Recordkeeping

Chapter 296-842 WAC

Rule

WAC 296-842-12005

Develop and maintain a written program

Exemption:

This section does **not** apply to respirator use that is voluntary.
See WAC 296-842-11005 for voluntary use program requirements.

(1) Develop a complete worksite-specific written respiratory protection program that includes the applicable elements listed in Table 3.

Note:

Pay for respirators, medical evaluations, fit-testing, training, maintenance, travel costs, and wages.

(2) Keep your program current and effective by evaluating it and making corrections. Do **all** of the following:

(a) Make sure procedures and program specifications are followed and appropriate.

(b) Make sure selected respirators continue to be effective in protecting employees. For example, if changes in work area conditions, level of employee exposure, or employee physical stress have occurred, you need to reevaluate your respirator selection.

(c) Have supervisors periodically monitor employee respirator use to make sure employees are using them properly.

(d) Regularly ask employees required to use respirators about their views concerning program effectiveness and whether they have problems with:

- Respirator fit during use
- Any effects of respirator use on work performance
- Respirators being appropriate for the hazards encountered
- Proper use under current worksite conditions
- Proper maintenance.

-Continued-

Written Respirator Program and Recordkeeping

Chapter 296-842 WAC

Rule

WAC 296-842-12005 (continued)

(e) When developing your written program include applicable elements listed in Table 3.

Table 3 **Required Elements for Required-Use Respirator Programs**
Selection: - Procedures for respirator selection - A list specifying the appropriate respirator for each respiratory hazard in your workplace - Procedures for issuing the proper type of respirator, if appropriate
Medical evaluation provisions
Fit-test provisions and procedures, if tight-fitting respirators are selected
Training provisions that address: - Respiratory hazards encountered during: • Routine activities • Infrequent activities, for example, bi-monthly cleaning of equipment • Reasonably foreseeable emergencies, for example, rescue, spill response, or escape situations - Proper use of respirators, for example, how to put on or remove respirators, and use limitations **Note:** You do **not** need to repeat training on respiratory hazards if employees have been trained on this in compliance with other rules such as WAC 296-800-170, Employer Chemical Hazard Communication in the WISHA Safety and Health Core Rules.
Respirator use procedures for: - Routine activities - Infrequent activities - Reasonably foreseeable emergencies
Maintenance: - Procedures and schedules for respirator maintenance covering: • Cleaning and disinfecting • Storage • Inspection and repair • When to discard respirators - A cartridge or canister change schedule **if** air-purifying respirators are selected for use against gas or vapor contaminants **and** an end-of-service-life-indicator (ESLI) isn't available. In addition, provide: • The data and other information you relied on to calculate change schedule values (for example, highest contaminant concentration estimates, duration of employee respirator use, expected maximum humidity levels, user breathing rates, and safety factors).
Procedures to ensure a safe air quantity and quality **if** atmosphere-supplying respirators (air-line or SCBA) are selected.
Procedures for evaluating program effectiveness on a regular basis

Written Respirator Program and Recordkeeping

Chapter 296-842 WAC

Rule

WAC 296-842-12010

Keep respirator program records

(1) Keep records of your current respirator program

(2) Keep each employee's current fit test record, if fit testing is conducted. Fit test records must include:

- (a) Employee name
- (b) Test date
- (c) Type of fit-test performed
- (d) Description (type, manufacturer, model, style, and size) of the respirator tested
- (e) Results of fit tests, for example, for quantitative fit tests include the overall fit factor **and** a print out, or other recording of the test.

(3) Keep training records that include employee's names and the dates trained

(4) Keep written recommendations from the LHCP.

(5) Allow records required by this section to be examined and copied by affected employees and their representatives.

Reference:

See chapter 296-802 WAC, Employee medical exposure records, for additional requirements that apply to medical records.

Notes

Respirator Selection

Chapter 296-842 WAC

Rule

WAC 296-842-13005

Select and provide appropriate respirators

Important:

See chapter 296-841 WAC, Airborne Contaminants, for:

- Hazard evaluation requirements. Evaluation results are necessary for respirator selection.
- References to substance-specific rules that may also apply to you and have additional respirator selection requirements. These references are found in the permissible exposure limit (PEL) table.

Helpful Tool:

Information about Respirator Selection and Classification

This document provides guidance about respirator selection and classification. You can find a copy in the Resources section of this chapter.

Select and provide, at no cost to employees, appropriate respirators for routine use, infrequent use, and reasonably foreseeable emergencies (such as escape, emergency, and spill response situations) by completing the following process:

-Continued-

Respirator Selection

Chapter 296-842 WAC

Rule

WAC 296-842-13005 (Continued)

Respirator Selection Process

Step 1: If your only respirator use is for escape, skip to Step 8 to select appropriate respirators.

Step 2: If the respiratory hazard is a biological aerosol, such as TB (tuberculosis), anthrax, psittacosis (parrot fever), or hanta virus, select a respirator appropriate for **nonemergency** activities recognized to present a health risk to workers **and** skip to Step 8.

- If respirator use will occur during **emergencies**, skip to Step 8 and document the analysis used to select the appropriate respirator.
- Use Centers for Disease Control (CDC) selection guidance for exposures to specific biological agents when this guidance exists. Visit http://www.cdc.gov.

Step 3: If the respiratory hazard is a pesticide, follow the respirator specification on the pesticide label **and** skip to Step 9.

Step 4: Determine the expected exposure concentration for each respiratory hazard of concern. Use the results from the evaluation required by Chapter 296-841 WAC, Airborne Contaminants.

-Continued-

WAC 296-842-13005 (Continued)

Step 5: Determine if the respiratory hazard is classified as IDLH; if it is **not** IDLH skip to Step 7.

- The respiratory hazard **is** classified as IDLH if:
  - The atmosphere is oxygen deficient or oxygen enriched

    or
  - You **cannot** measure or estimate your expected exposure concentration

    or
  - Your measured or estimated expected exposure concentration is greater or equal to the IDLH value in the NIOSH *Pocket Guide to Chemical Hazards*

Note:

- WISHA uses the IDLH values in the 1990 edition of the NIOSH *Pocket Guide to Hazardous Chemicals* to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit www.cdc.gov/niosh for more information.
- If your measured or estimated expected exposure concentration is below NIOSH's IDLH values, proceed to Step 7.

-Continued-

Respirator Selection

Chapter 296-842 WAC

Rule

WAC 296-842-13005 (Continued)

Step 6: Select an appropriate respirator from one of the following respirators for IDLH conditions and skip to Step 8:

- Full-facepiece, pressure demand, self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of 30 minutes

  or

- Full-facepiece, pressure demand air-line respirator equipped with an auxiliary self-contained air supply

Exception:

If the respiratory hazard is oxygen deficiency **and** you can show oxygen concentrations can be controlled within the ranges listed in **Table 4** under **all** foreseeable conditions, you are allowed to select **any** type of SCBA or air-line respirator:

Table 4
Concentration Ranges for Oxygen Deficiency

Altitude (as ft. above sea level)	**Oxygen Concentration Range** (as percent oxygen)
Below 3,001	16.0 -19.5
3,001 - 4, 000	16.4 -19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 7,000	18.5 – 19.5
7,001 - 8,000	19.3 – 19.5
Above 8,000 feet the exception doesn't apply. Oxygen enriched breathing air must be supplied above 14,000 feet.	

-Continued-

WAC 296-842-13005 (Continued)

Step 7: Select respirator types with assigned protection factors (APFs) from **Table 5** that are appropriate to protect employees from the expected exposure concentration.

Note:

- The helpful tool, Using Assigned Protection Factors (APFs) for respirator selection, found in the resource section of this chapter, utilizes the hazard-ratio approach established by ANSI Z88.2-1992 to determine which respirator types can provide a sufficient level of protection.
- If **no** permissible exposure limit (PEL) is established for an airborne contaminant, use relevant available information and informed professional judgment to determine an acceptable exposure limit value to use for calculating hazard ratios. For example, you may use exposure limit values established by the American Conference of Governmental Industrial Hygienists (ACGHI).

Step 8: Consider hazards that could require selection of specific respirator types. For example, select full-facepiece respirators to prevent eye irritation or abrasive blasting helmets to provide particle rebound protection.

Note:

- Rules for specific substances have additional selection specifications that apply to escape and other types of respirators. Make sure you follow those additional requirements before finalizing your selection.

-Continued-

Respirator Selection

Chapter 296-842 WAC

Rule

WAC 296-842-13005 (Continued)

Step 9: Evaluate user and workplace factors that might compromise respirator performance, reliability or safety.

Examples:

- High humidity or temperature extremes in the workplace.
- Necessary voice communication.
- High traffic areas and moving machinery.
- Time or distance for escape.

- If respirator use is for escape only, follow this step and then skip to **Step 11**.
- If the respiratory hazard is a pesticide, follow the requirements on the pesticide label and skip to **Step 11**.

Step 10: Follow **Table 6** requirements to select an air-purifying respirator.

- If Table 6 requirements can't be met, you must select an appropriate air-line respirator or an SCBA.

Step 11: Make sure respirators you select are certified by the National Institute for Occupational Safety and Health (NIOSH).

- Respirators provided exclusively for escape from IDLH atmospheres must be NIOSH-certified for escape from the atmosphere in which they will be used.
- To maintain certification, make sure the respirator is used according to cautions and limitations specified on the NIOSH approval label. This includes manufacturer restrictions on cartridges and canisters.

Note:

While selecting respirators, you will need to select a sufficient number of types, models or sizes to provide for fit testing. You can also consider other respirator use issues, such as accommodating facial hair with a loose fitting respirator.

Helpful Tool:

Key Information about NIOSH Certified Respirators

This document will help you understand how to find and use NIOSH certification information. You can find a copy in the Resources section of this chapter

-Continued-

WAC 296-842-13005 (Continued)

Use Table 5 to identify the assigned protection factor for different types of respirators.

These assigned protection factors are only effective when the employer implements a continuing, effective respirator program as required by this chapter, including training, fit testing, maintenance, and use requirements.

You may select respirators assigned for use in higher workplace concentrations of a hazardous substance for use at lower concentrations of that substance, or when required use is independent of concentration.

Table 5
Assigned Protection Factors (APF) for Respirator Types

If the respirator is a(n)	Then the APF is
Air-purifying respirator with a:	
• Quarter-mask	5
• Half-facepiece. This category includes filtering facepiece and elastomeric facepiece	10
• Full-facepiece	50
Powered air-purifying respirator (PAPR) with a:	
• Loose-fitting facepiece	25
• Half-facepiece	50
• Full-facepiece	1000
• Hood or helmet	25/1000 (see note)
Note: PAPRs with helmets/hoods may receive an APF of 1000 only when you have evidence that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater. Such evidence must be provided by the respirator manufacturer. This level of performance can best be demonstrated by performing a workplace protection factor (WPF) or simulated workplace protection factor (SWPF) study or equivalent testing.	

-Continued-

Rule

WAC 296-842-13005 (Continued)

Table 5 (continued) Assigned Protection Factors (APF) for Respirator Types	
If the respirator is a(n)	**Then the APF is**
Air-line respirator with a:	
• Half-facepiece and designed to operate in demand mode	10
• Loose-fitting facepiece and designed to operate in continuous flow mode	25
• Half-facepiece and designed to operate in continuous-flow mode	50
• Half-facepiece and designed to operate in pressure-demand or other positive-pressure mode	50
• Full-facepiece and designed to operate in demand mode.	50
• Full-facepiece and designed to operate in continuous-flow mode	1000
• Full-facepiece and designed to operate in pressure-demand or other positive-pressure mode.	1000
• Helmet or hood and designed to operate in continuous-flow mode	25/1000 (see note)
Note: Air-line respirators with helmets/hoods designed to operate in continuous-flow mode may receive an APF of 1000 when you have evidence that testing of these respirators demonstrates performance at a level of protection of 1,000 or greater. Such evidence must be provided by the respirator manufacturer. This level of performance can best be demonstrated by performing a workplace protection factor (WPF) or simulated workplace protection factor (SWPF) study or equivalent testing.	
Self-contained breathing apparatus (SCBA) with a tight fitting:	
• Half-facepiece and designed to operate in demand mode	10
• Full facepiece and designed to operate in demand mode	50
• Full-facepiece and designed to operate in pressure-demand mode or other positive pressure mode (e.g. open/closed circuit)	10,000
• Helmet or hood and designed to operate in demand mode	50
• Helmet or hood and designed to operate in pressure-demand or other positive-pressure mode (e.g., open/closed circuit).	10,000
Combination respirators:	
• When using a combination respirator, such as an air-line respirator with an air-purifying filter, you must make sure the APF is appropriate to the mode of operation in which the respirator is used.	
Escape respirators:	
• APFs in this table do not apply to respirators used solely for escape. To select escape respirators, go to Step 8 of this section.	

-Continued-

Rule

WAC 296-842-13005 (Continued)

Use Table 6 to select air-purifying respirators for particle, vapor, or gas contaminants.

Table 6
Requirements for Selecting Any Air-purifying Respirator

If the contaminant is a	Then
Gas or vapor	Provide a respirator with canisters or cartridges equipped with a NIOSH-certified, end-of-service-life indicator (ESLI) **or** If a canister or cartridge with an ESLI is **not** available, develop a cartridge change schedule to make sure the canisters or cartridges are replaced before they are no longer effective **or** Select an atmosphere-supplying respirator
Particle, such as a dust, spray, mist, fog, fume, or aerosol	Select respirators with filters certified to be at least 95% efficient by NIOSH. For example, N95s, R99s, P100s, or High Efficiency Particulate Air (HEPA) filters **or** You may select respirators NIOSH certified as "dust and mist," "dust, fume, or mist," or "pesticides." You can only use these respirators if particles primarily have a mass median aerodynamic diameter of at least 2 micrometers. **Note:** These respirators are no longer sold for occupational use.

Notes

Medical Evaluations

Chapter 296-842 WAC

Rule

WAC 296-842-14005
Provide medical evaluations

Important:

If you have provided an employee with a medical evaluation addressing respirator use, as required by another chapter, that evaluation will meet the requirements of this section.

Follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them.

Helpful Tool:

Planning for Medical Evaluations

This information can help you prepare for employee medical evaluations. You can find a copy of this form in the Resources section of this chapter.

-Continued-

Medical Evaluations

Chapter 296-842 WAC

Rule

WAC 296-842-14005 (Continued)

Medical Evaluation Process

Step 1: Identify employees who need medical evaluations **and** determine the frequency of evaluations from Table 7. Include employees who:

- Are required to use respirators

  or

- Voluntarily use respirators that aren't filtering-facepiece respirators

Note:

You may use a previous employer's medical evaluation for an employee if you can:

- Show the employee's previous work and use conditions were substantially similar to yours

  and

- Obtain a copy of the licensed health care professional's (LHCP's) written recommendation approving the employee's use of the respirator chosen by you.

Step 2: Identify a licensed health care professional (LHCP) to perform your medical evaluations.

Note:

If you select a different LHCP, you don't need to have new medical evaluations done.

-Continued-

WAC 296-842-14005 (Continued)

Step 3: Make sure your LHCP has the following information **before** the evaluation is completed:

- Information describing the respirators employees may use, including the weight and type.
- How the respirators will be used, including:
  - How often the respirator will be used, for example, daily, or once a month
  - The duration of respirator use, for example, a minimum of one hour, or up to 12 hours
  - The employee's expected physical work effort
  - Additional personal protective clothing and equipment to be worn
  - Temperature and humidity extremes expected during use
- A copy of your written respiratory protection program and this chapter.

Note:

- You may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

Medical Evaluations

Chapter 296-842 WAC

Rule

WAC 296-842-14005 (Continued)

Step 4: Administer the medical questionnaire in WAC 296-842-22005 to employees, **or** provide them a medical exam that obtains the same information.

Note:

You may use on-line questionnaires if the questions are the same and requirements of this section are met.

- Administer the examination or questionnaire at no cost to employees:
  - During the employee's normal working hours

    or
  - At a time and place convenient to the employee
- Maintain employee confidentiality during examination or questionnaire administration:
  - Do **not** view employee's answers on the questionnaire
  - Do **not** act in a manner that may be considered a breach of confidentiality

Note:

Providing confidentiality is important for securing successful medical evaluations. It helps make sure the LHCP gets complete and dependable answers on the questionnaire.

- Make sure employees understand the content of the questionnaire.
- Provide the employee with an opportunity to discuss the questionnaire or exam results with the LHCP.

-Continued-

WAC 296-842-14005 (Continued)

Step 5: Provide follow-up evaluation for employees when:

- The LHCP needs more information to make a final recommendation

  or

- An employee gives any positive response to questions 1-8 in Part 2 **or** to questions 1-6 in Part 3 of the WISHA Medical Evaluation Questionnaire in WAC 296-842-22005.

Note:

Follow-up may include:

- Employee consultation with the LHCP such as a telephone conversation to evaluate positive questionnaire responses
- Medical exams
- Medical tests or other diagnostic procedures.

Step 6: Obtain a written recommendation from the LHCP that contains only the following medical information:

- Whether or not the employee is medically able to use the respirator
- Any limitations of respirator use for the employee
- What future medical evaluations, if any, are needed
- A statement that the employee has been provided a copy of the written recommendation.

Step 7: Provide a powered, air-purifying respirator (PAPR) when the LHCP determines the employee shouldn't wear a negative-pressure air-purifying respirator **and** is able to wear a PAPR.

Reference:

See WAC 296-842-130 for requirements regarding selection of air-purifying respirators.

-Continued-

Medical Evaluations

Chapter 296-842 WAC

Rule

WAC 296-842-14005 (Continued)

Note:

- You may discontinue medical evaluations for an employee when the employee no longer uses a respirator.
- If you have staff conducting your medical evaluations, they may keep completed questionnaires and findings as confidential medical records, if they are maintained separately from other records.

Use Table 7 to determine medical evaluation frequency.

Table 7
Evaluation Frequency

Type of Evaluation	When Required
Initial medical evaluations	Before respirators are fit-tested or used in the workplace.
Subsequent medical evaluations	If any of these occur: - Your licensed health care professional (LHCP) recommends them; for example, periodic evaluations at specified intervals. - A respirator program administrator or supervisor informs you that an employee needs reevaluation - Medical signs or symptoms (such as breathing difficulties) are: • Observed during fit-testing or program evaluation **or** • Reported by the employee - Changes in worksite conditions such as physical work effort, personal protective clothing, or temperature that could substantially increase the employee's physiological stress

WAC 296-842-15005

Conduct fit testing

(1) Provide, at no cost to the employee, fit-tests for **all** tight fitting respirators on the following schedule:

(a) Before employees are assigned duties that may require the use of respirators

(b) At least every 12 months after initial testing

(c) Whenever any of the following occurs:

- A different respirator facepiece is chosen such as a different type, model, style, or size
- You become aware of a physical change in an employee that could affect respirator fit. For example, you may observe, or be told about, facial scarring, dental changes, cosmetic surgery, or obvious weight changes
- An employee notifies you, or your LHCP, that the respirator fit is unacceptable. During the retest, you must give an employee reasonable opportunity to select a different respirator facepiece (size, model, etc.).

Note:

You may accept a fit-test completed by a previous employer **if**:

- You obtain written documentation of the fit-test

  and

- The results of the fit-test aren't more than 12 months old

  and

- The employee will use the same respirator (the same type, model, style, and size)

  and

- The fit test was conducted in a way that meets the requirements of WAC 296-842-150 and 296-842-22010.

-Continued-

Fit Testing

Chapter 296-842 WAC

Rule

WAC 296-842-15005 (Continued)

(2) Select and use an appropriate fit-testing procedure from WAC 296-842-22010 of this chapter

(3) Use quantitative fit-test methods when a negative pressure respirator will be used in concentrations requiring a protection factor greater than 10. This includes:

- Full facepiece air-purifying respirators
- SCBAs operated in demand (negative pressure) mode
- Air-line respirators operated in demand mode.

(4) Make sure tight-fitting PAPRs, SCBAs, or air-line respirators are fit tested in negative-pressure mode. This must be done by either:

(a) Temporarily converting the respirator user's actual facepiece into a negative pressure respirator using the appropriate filters

or

(b) Using an identical negative pressure air-purifying respirator facepiece as a surrogate for the SCBA, air-line or PAPR. The surrogate facepiece must have the same sealing surfaces as the SCBA, air-line, or PAPR.

Remove any modifications made to the respirator facepiece for fit testing and return the facepiece to the NIOSH approved configuration before the facepiece is used in the workplace.

(5) Make sure the person conducting fit testing is able to do **all** of the following:

(a) Prepare test solutions if required
(b) Make sure equipment works properly
(c) Perform tests properly
(d) Recognize invalid tests
(e) Calculate fit factors properly if required.

Note:

- No specific training program or certification is required for those who conduct fit tests.
- You should consider evaluating these individuals to determine their proficiency in the fit-testing method to be used.
- You can use an evaluation form such as the form included in the American National Standard for Respirator Fit Testing Methods, ANSI/AIHA Z88.10-2001 to determine if the individual meets these requirements. Visit www.ansi.org or www.aiha.org.

WAC 296-842-16005

Provide effective training

(1) Train employees, based on their duties, if they do any of the following:
   (a) Use respirators
   (b) Supervise respirator users
   (c) Issue, repair, or adjust respirators

(2) Present effective training in a way that employees understand.

Note:

- Training may be provided using audiovisuals, slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs conducted by outside sources, or a combination of these methods.
- You may want to have instructors available when using video or automated training methods to:
  - Encourage and provide responses to questions for the benefit of employees
  - Evaluate employees' understanding of the material
  - Provide other instructional interaction to employees.

(3) Make sure a qualified instructor provides training

(4) Provide training, at no cost to the employee, at these times:
   (a) Initially, before worksite respirator use begins
   (b) Periodically, within 12 months of the previous training

-Continued-

Training

Chapter 296-842 WAC

Rule

WAC 296-842-16005 (Continued)

(c) Additionally, when the following occur:

- The employee hasn't retained knowledge or skills

  or

- Changes in the worksite, or type of respirator make previous training incomplete or obsolete.

Note:

- You may accept an employee's previous training, such as training provided by another employer, to satisfy the initial training requirement if:
  - You can demonstrate the employee received training within the past 12 months

    and

  - The employee can demonstrate the knowledge and skills to use required respirators effectively.
- If you accept an employee's previous training to satisfy the initial training requirement, you are still responsible for providing periodic, and additional training when needed. Periodic training would need to be provided within 12 months of the employee's previous training.

-Continued-

WAC 296-842-16005 (Continued)

(5) Make sure employees can demonstrate the following knowledge and skills as required by their duties:

(a) Why the respirator is necessary. Include, for example, information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms

(b) The respirator's capabilities and limitations. Include, for example, how the respirator provides protection and why air-purifying respirators can't be used in oxygen-deficient conditions

(c) How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability

(d) How to properly inspect, put on, seal check, use, and remove the respirator

(e) How to clean, disinfect, repair, and store the respirator, or how to get this done by someone else

(f) How to use the respirator effectively in emergency situations; including what to do when a respirator fails and where emergency respirators are stored

(g) Medical signs and symptoms that may limit or prevent the effective use of respirators such as shortness of breath or dizziness

(h) The employer's general obligations under this chapter. For example, developing a written program, selecting appropriate respirators, and providing medical evaluations.

Notes

WAC 296-842-17005

Maintain respirators in a clean and reliable condition

(1) Make sure respirators are kept, at no cost to the employee, clean, sanitary and in good working order.

(2) Clean and disinfect respirators as often as specified in Table 8 of this section.

Note:

- Use required cleaning and disinfecting procedures in WAC 296-842-22015, or the manufacturer's procedures that:
  - Result in a clean and sanitary respirator
  - Don't damage the respirator
  - Don't harm the user
- Automated cleaning and disinfecting are permitted
- Cleaning and disinfecting may be done by a central facility as long as you make sure respirators provided are clean, sanitary, and function properly.

(3) Make sure respirators are assembled properly after cleaning or disinfecting.

-Continued-

Maintenance

Chapter 296-842 WAC

Rule

WAC 296-842-17005 (Continued)

Table 8 Required Frequencies for Cleaning and Disinfecting Respirators	
If, the respirator will be	**Then, clean and disinfect the respirator**
Used exclusively by one employee	As often as needed to: - Keep it clean and functional **and** - To prevent health hazards such as skin irritation
Shared for nonemergency use **or** Used for fit-testing or training	**Before** it is worn by another employee
Shared for emergency use	**After** each use so the respirator is immediately ready for use at all times

WAC 296-842-17010

Store respirators properly

(1) Store respirators to protect them from **all** of the following:

(a) Deformation of the facepiece or exhalation valve

(b) Sunlight or extreme temperatures or other conditions

(c) Contamination such as dust or damaging chemicals

(d) Excessive moisture.

Note:

Use coffee cans, sealable plastic bags, or other suitable means of protection.

(2) Follow these additional requirements for emergency respirators:

(a) Keep respirators accessible to the work area

(b) Store respirators in compartments or with covers clearly marked as containing emergency respirators

(c) Follow additional storage instructions from the respirator manufacturer

(d) Store an adequate number of emergency respirators in each area where they may be needed.

Note:

Emergency respirators include mouthpiece respirators and other respirators that are limited to escape-only use by their NIOSH certification.

Maintenance

Chapter 296-842 WAC

Rule

WAC 296-842-17015

Inspect and repair respirators

(1) Conduct respirator inspections as often as specified in Table 9.

(2) Make sure respirator inspections cover **all** of the following:

- (a) Respirator function
- (b) Tightness of connections
- (c) The condition of the facepiece, head straps, valves, connecting tubes, and cartridge, canisters or filters
- (d) Pliability and deterioration of elastomeric parts
- (e) Maintenance of air or oxygen cylinders
- (f) Making sure SCBA air cylinders are at 90% of the manufacturer's recommended pressure level
- (g) Proper functioning of SCBA regulators when air-flow is activated
- (h) Proper functioning of SCBA low-pressure warning devices when activated

(3) Certify inspections for emergency respirators by documenting the following:

- (a) Inspection date
- (b) Serial number of each respirator or other identifying information
- (c) Inspector's name or signature
- (d) Inspection findings
- (e) Required action, if problems are found.

-Continued-

WAC 296-842-17015 (Continued)

Note:

When documenting inspections you may either:

- Provide the information on a tag or label and attach it to the respirator compartment

  or

- Include the information in an inspection report stored in paper or electronic files accessible to employees.

(4) Repair or replace any respirator that isn't functioning properly **before** the employee returns to a situation where respirators are required. If respirators fail inspection or aren't functioning properly during use due to problems such as leakage, vapor or gas breakthrough, or increased breathing resistance **all** of the following apply:

(a) Do **not** permit such respirators to be used until properly repaired or adjusted

(b) Use only NIOSH-certified parts

(c) Make sure repairs and adjustments are made by appropriately trained individuals. Use the manufacturer or a technician trained by the manufacturer to repair or adjust reducing and admission valves, regulators, and warning devices on SCBAs or air-line respirators.

(d) Follow the manufacturer's recommendations and specifications for the type and extent of repairs.

-Continued-

Maintenance

Chapter 296-842 WAC

Rule

WAC 296-842-17015 (Continued)

(5) Use Table 9 to determine how often to inspect respirators.

Table 9
Required Frequencies for Respirator Inspections

If the respirator is	Then inspect
A SCBA in any use	Before each use **and** During cleaning **or** Monthly if **not** used
Used for nonemergencies, including day-to-day or infrequent use	Inspect before each use **and** During cleaning
Used only for emergencies	Check for proper function **before** and after **each** use **and** Inspect at least monthly as instructed by the manufacturer
Used for escape-only purposes	Before carrying into a work place for use

Safe Use and Removal of Respirators

Chapter 296-842 WAC

Rule

WAC 296-842-18005

Prevent sealing problems with tight-fitting respirators

(1) Make sure employees use the procedure in WAC 296-842-22020 to perform a user seal check each time they put on their tight-fitting respirator.

(2) Make sure you do **not** permit respirator use if employees have a characteristic that interferes with the respirator facepiece seal or valve function. For example, stubble, moustaches, sideburns, bangs, hairlines, or scars between the face and the sealing surface of the respirator will affect the seal.

(3) Make sure corrective glasses or personal protective equipment (PPE) do **not** interfere with the facepiece seal. Examples of PPE include safety glasses, goggles, faceshields, clothing, and hard hats.

WAC 296-842-18010

Make sure employees leave the use area before removing respirators

Make sure employees leave the use area for **any** of these reasons:

- To replace air-purifying filters, cartridges, or canisters
- When they smell or taste (detect) vapor or gas leakage from, for example, cartridges, canister, or the facepiece seal
- When they detect changes in breathing resistance
- To readjust their respirators
- To wash their faces and respirators as necessary to prevent skin or eye irritation
- If they become ill
- If they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, or chills.

Notes

Standby Requirements for Immediately Dangerous to Life or Health (IDLH) Conditions

Chapter 296-842 WAC

Rule

WAC 296-842-19005

Provide standby assistance in immediately dangerous to life or health (IDLH) conditions

Important:

WISHA currently uses the IDLH values in the 1990 NIOSH *Pocket Guide to Chemical Hazards* to determine the existence of IDLH conditions. You may use more recent editions of this guide. Visit www.cdc.gov/niosh for more information.

(1) Provide at least 2 standby employees outside the IDLH area.

Note:

You need only one standby employee **if** the IDLH condition is well characterized, will remain stable **and** you can show one employee can adequately do **all** of the following:

- Monitor employees in the IDLH area
- Implement communication
- Initiate rescue duties.

(2) Train and equip standby employees to provide effective emergency rescue. Equip them with:

(a) A pressure-demand SCBA or a pressure-demand air-line respirator with an auxiliary SCBA, for each standby employee

(b) Appropriate retrieval equipment, when it would help with the effective rescue of the entrant, or an equivalent means of rescue

(3) Make sure standby employees maintain visual, voice, or signal line communication with employees in the IDLH area

(4) Make sure that in the event of an emergency:

(a) Standby employees notify you or your designee before they enter the IDLH area to provide emergency rescue

(b) You provide necessary assistance when notified

Notes

Air Quality for Self-Contained Breathing Apparatus (SCBA) and Air-Line Respirators

Chapter 296-842 WAC

Rule

WAC 296-842-20005

Make sure breathing air and oxygen meet established specifications

(1) Make sure that all SCBAs and air-line respirators are provided with safe breathing air and oxygen.

(2) Compressed breathing air must meet the following specifications for Grade D air:

- (a) Oxygen (volume/volume) within 19.5-23.5%
- (b) Hydrocarbon (condensed): no more than 5 milligrams per cubic meter of air
- (c) Carbon **monoxide** (CO): no more than 10 parts per million (ppm)
- (d) Carbon **dioxide** (CO_2): no more than 1,000 ppm
- (e) No noticeable odor

Reference:

See the American National Standards Institute - Compressed Gas Association Commodity Specification for Air (G-7.1.1989) for more information. Contact your local library to access a copy.

(3) Make sure the moisture content of the air supplied meets the following:

- (a) Air supplied to respirators from cylinders must not exceed a dew point of -50°F (or -45.6°C) at 1 atmospheric pressure.
- (b) Compressor supplied air must not exceed a dew point of 10°F (or 5.56°C) below the use temperature at 1 atmospheric pressure.

(4) Cylinders of breathing air purchased or otherwise obtained from a supplier must have a certificate of analysis from the supplier verifying each cylinder's contents meet Grade D breathing air requirements and dew point standards.

(5) Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen.

Air Quality for Self-Contained Breathing Apparatus (SCBA) and Air-Line Respirators

Chapter 296-842 WAC

Rule

WAC 296-842-20010

Prevent conditions that could create a hazardous breathing air supply

(1) Use SCBA and air-line respirators safely:

- **Do not** supply compressed oxygen to SCBAs or air-line respirators that previously used compressed air.

Note:

Compressed air leaves residues containing hydrocarbons such as oil or grease. Fire or explosion can occur if compressed oxygen makes contact with these residues.

(2) Use breathing air couplings on air-line respirators that are **not** compatible with couplings for nonrespirable air or other gas systems, for example, utility air used for manufacturing purposes.

(3) **Do not** allow asphyxiating substances to enter breathing air lines; for example, don't flush nitrogen through worksite air lines also used for breathing air.

(4) Use equipment specifically designed for oxygen service or distribution **if** oxygen concentrations greater than 23.5% are used.

Note:

Respiratory equipment **not** designed for oxygen service or distribution can create fire or explosion hazards in oxygen concentrations higher than 23.5%.

-Continued-

WAC 296-842-20010 (Continued)

(5) Make sure cylinders used to supply breathing air for SCBAs or air-line respirators are tested and maintained as described in the federal Department of Transportation's (DOT) Shipping Container Specification Regulations, Title 49 CFR.

Note:

- Use only cylinders marked (with serial number, cylinder pressure, DOT exemption number, and test dates) according to these DOT regulations
- To find any Code of Federal Regulations (CFR) visit: www.access.gpo.gov.

WAC 296-842-20015

Make sure compressors don't create a hazardous breathing air supply

Important:

- Ambient-air movers (or pumps) used to supply air to respirators must be used according to the manufacturer's instructions.
- Respirators used with ambient-air movers must be approved by NIOSH to operate within the pressure ranges of the air mover.

-Continued-

Air Quality for Self-Contained Breathing Apparatus (SCBA) and Air-Line Respirators

Chapter 296-842 WAC

Rule

WAC 296-842-20015 (Continued)

(1) Locate or modify compressor intakes so they won't pick up contaminated air **or** exhaust gases such as carbon monoxide (CO) from:

- Fuel-powered vehicles

  or

- The internal combustion motor of the compressor

  or

- Other contaminant sources in the area, for example, a ventilation system discharge.

Note:

- You may need to reposition or extend the compressor's intake or engine exhaust pipe or outlet, especially if they are located near each other.
- Be aware that exhaust gases may not adequately disperse when the compressor is operated in:
  - An enclosed space such as a small room, a corner, or near a wall

    or

  - In turbulent wind conditions.

-Continued-

WAC 296-842-20015 (Continued)

(2) Equip compressors with suitable air-purifying filters, water traps, and sorbents (such as charcoal beds) and maintain them as follows:

(a) Periodically change or clean them according to the manufacturer or supplier's instructions

(b) Keep a tag at the compressor with the following information:

- When the sorbent and filters were last replaced or cleaned
- The date of the most recent changes or cleaning
- The signature of the person authorized by the employer to perform changes or cleaning.

Note:

To be sure you are providing the recommended operating pressure for respirators, you may need to install a delivery pressure gauge where the respirator's airline hose attaches to the manifold or other air outlet.

(3) Make sure the carbon monoxide (CO) level in breathing air from compressors does **not** exceed 10 parts per million (ppm).

Maintain CO levels below 10 ppm in oil lubricated compressors by using at least one of the following:

(a) An effective CO alarm

(b) An effective high temperature alarm **and** testing the air supply often enough to prevent CO levels from exceeding 10 ppm.

-Continued-

Air Quality for Self-Contained Breathing Apparatus (SCBA) and Air-Line Respirators

Chapter 296-842 WAC

Rule

WAC 296-842-20015 (Continued)

Note:

- If you do not have a reliable CO-free area available for locating your compressor intake, consider these examples of methods to prevent CO contamination of the air supply:
  - Use of continuous and effective carbon monoxide alarms and filters
  - Conduct frequent monitoring of air quality
  - Use a CO converter (converts CO to carbon dioxide).
- How often to test depends on a number of considerations, for example:
  - Compressor age
  - Maintenance history of the compressor
  - Stability of CO readings
- If the CO or high temperature alarm can't be heard by the employee, a flashing light or other effective alternative to an audio alarm needs to be used
- Safeguards, such as alarms, are necessary to prevent CO contamination resulting from compressor overheating. When alarms are provided, proper maintenance practices such as periodic inspections and calibration will help make sure alarms remain effective.
- Any type of oil-lubricated compressor, such as screw or piston types, may produce dangerous levels of CO if overheating occurs
  - Old compressors are known to leak oil due to worn parts, increasing the possibility for overheating. Newer compressors may also overheat if maintenance practices are poor. For example, poor maintenance practices may lead to disconnected or incorrectly set alarms, inoperative shut-offs, or an impaired cooling system
  - You need to instruct employees to move to a safe area when the alarm sounds **and** to stop using respirators.

Labeling of Air-Purifying Respirator Filters, Cartridges, and Canisters

Chapter 296-842 WAC

Rule

WAC 296-842-21005

Keep labels readable on respirator filters, cartridges, and canisters during use

Make sure the NIOSH certification labeling and color-coding on air-purifying respirator filters, cartridges, and canisters remains readable and intact during use.

Link:

Color-coding specifications for manufacturers can be found in Title 42 CFR, Part 84. Visit www.cdc.gov/niosh.

Notes

WAC 296-842-22005

Use this medical questionnaire for medical evaluations

Use the medical questionnaire in Table 10 when conducting medical evaluations.

Note:

- You may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.
- You may use on-line questionnaires if the questions are the same and the requirements in WAC 296-842-140 of this chapter are met.
- You may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions.
- The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

-Continued-

Required Procedures for Respiratory Protection Program

Chapter 296-842 WAC

Rule

WAC 296-842-22005 (Continued)

Table 10 WISHA Medical Evaluation Questionnaire
Employer Instructions: • You may use on-line questionnaires if the requirements in WAC 296-842-14005 are met. • You must tell your employee how to deliver or send the completed questionnaire to the health care provider you have selected. • You must **not** review employees' questionnaires.
Health care provider's instructions: • Review the information in this questionnaire and any additional information provided to you by the employer. • You may add questions to this questionnaire at your discretion; **However**, questions in Parts 1-3 may not be deleted or substantially altered. • Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: phone consultations to evaluate positive responses, medical tests, and diagnostic procedures. • When your evaluation is complete, send a copy of your written recommendation to the employer **and** employee.
Employee information and instructions: • Your employer must allow you to answer this questionnaire during normal working hours, or at a time and place that is convenient to you. • Your employer or supervisor must not look at or review your answers at any time.

-Continued-

Part 2-General Health Information
ALL employees must complete this part - Please check "Yes" or "No"

1.	Do you currently smoke tobacco, or have you smoked tobacco in the last month?	☐ Yes	☐ No
2.	Have you ever had any of the following conditions?		
	Seizures (fits):	☐ Yes	☐ No
	Diabetes (sugar disease):	☐ Yes	☐ No
	Allergic reactions that interfere with your breathing:	☐ Yes	☐ No
	Claustrophobia (fear of closed-in places):	☐ Yes	☐ No
	Trouble smelling odors:	☐ Yes	☐ No
3.	Have you ever had any of the following pulmonary or lung problems?		
	Asbestosis:	☐ Yes	☐ No
	Asthma:	☐ Yes	☐ No
	Chronic bronchitis:	☐ Yes	☐ No
	Emphysema:	☐ Yes	☐ No
	Pneumonia:	☐ Yes	☐ No
	Tuberculosis:	☐ Yes	☐ No
	Silicosis:	☐ Yes	☐ No
	Pneumothorax (collapsed lung):	☐ Yes	☐ No
	Lung cancer:	☐ Yes	☐ No
	Broken ribs:	☐ Yes	☐ No
	Any chest injuries or surgeries:	☐ Yes	☐ No
	Any other lung problem that you have been told about:	☐ Yes	☐ No
4.	Do you currently have any of the following symptoms of pulmonary or lung illness?		
	Shortness of breath:	☐ Yes	☐ No
	Shortness of breath when walking fast on level ground or walking up a slight hill or incline:	☐ Yes	☐ No
	Shortness of breath when walking with other people at an ordinary pace on level ground:	☐ Yes	☐ No
	Have to stop for breath when walking at your own pace on level ground:	☐ Yes	☐ No
	Shortness of breath when washing or dressing yourself:	☐ Yes	☐ No
	Shortness of breath that interferes with your job:	☐ Yes	☐ No
	Coughing that produces phlegm (thick sputum):	☐ Yes	☐ No
	Coughing that wakes you early in the morning:	☐ Yes	☐ No
	Coughing that occurs mostly when you are lying down:	☐ Yes	☐ No
	Coughing up blood in the last month:	☐ Yes	☐ No
	Wheezing:	☐ Yes	☐ No
	Wheezing that interferes with your job:	☐ Yes	☐ No
	Chest pain when you breathe deeply:	☐ Yes	☐ No
	Any other symptoms that you think may be related to lung problems:	☐ Yes	☐ No

Required Procedures for Respiratory Protection Program

Chapter 296-842 WAC

Rule

Part 1-Employee Background Information

ALL employees must complete this part
Please print

1. Today's date:_____
2. Your name:_____
3. Your age (to nearest year):_____
4. Sex (circle one): Male / Female
5. Your height: _____ft._____in.
6. Your weight: _____lbs.
7. Your job title:
8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include Area Code):_____
9. The best time to call you at this number:_____
10. Has your employer told you how to contact the health care professional who will review this questionnaire? ☐ Yes ☐ No
11. Check the type of respirator(s) you will be using:
    a. _____N, R, or P filtering facepiece respirator (for example, a dust mask, OR an N95 filtering facepiece respirator).
    b. Check all that apply.
    ☐ Full facepiece mask ☐ Escape
    ☐ Non-powered cartridge or canister
    ☐ Supplied-air or Air-line
    Other:_____
12. Have you previously worn a respirator? ☐ Yes ☐ No
    If "yes," describe what type(s):_____

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Part 2-General Health Information
ALL employees must complete this part - Please check "Yes" or "No"

1. Do you **currently** smoke tobacco, or have you smoked tobacco in the last month? ☐ Yes ☐ No

2. Have you **ever had** any of the following conditions?

a. Seizures (fits): ☐ Yes ☐ No
b. Diabetes (sugar disease): ☐ Yes ☐ No
c. Allergic reactions that interfere with your breathing: ☐ Yes ☐ No
d. Claustrophobia (fear of closed-in places): ☐ Yes ☐ No
e. Trouble smelling odors: ☐ Yes ☐ No

3. Have you **ever had** any of the following pulmonary or lung problems?

a. Asbestosis: ☐ Yes ☐ No
b. Asthma: ☐ Yes ☐ No
c. Chronic bronchitis: ☐ Yes ☐ No
d. Emphysema: ☐ Yes ☐ No
e. Pneumonia: ☐ Yes ☐ No
f. Tuberculosis: ☐ Yes ☐ No
g. Silicosis: ☐ Yes ☐ No
h. Pneumothorax (collapsed lung): ☐ Yes ☐ No
i. Lung cancer: ☐ Yes ☐ No
j. Broken ribs: ☐ Yes ☐ No
k. Any chest injuries or surgeries: ☐ Yes ☐ No
l. Any other lung problem that you have been told about: ☐ Yes ☐ No

4. Do you **currently** have any of the following symptoms of pulmonary or lung illness?

a. Shortness of breath: ☐ Yes ☐ No
b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: ☐ Yes ☐ No
c. Shortness of breath when walking with other people at an ordinary pace on level ground: ☐ Yes ☐ No
d. Have to stop for breath when walking at your own pace on level ground: ☐ Yes ☐ No
e. Shortness of breath when washing or dressing yourself: ☐ Yes ☐ No
f. Shortness of breath that interferes with your job: ☐ Yes ☐ No
g. Coughing that produces phlegm (thick sputum): ☐ Yes ☐ No
h. Coughing that wakes you early in the morning: ☐ Yes ☐ No
i. Coughing that occurs mostly when you are lying down: ☐ Yes ☐ No
j. Coughing up blood in the last month: ☐ Yes ☐ No
k. Wheezing: ☐ Yes ☐ No
l. Wheezing that interferes with your job: ☐ Yes ☐ No
m. Chest pain when you breathe deeply: ☐ Yes ☐ No
n. Any other symptoms that you think may be related to lung problems: ☐ Yes ☐ No

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Part 2-General Health Information (Continued)

5. Have you **ever had** any of the following cardiovascular or heart problems?

a. Heart attack: ☐ Yes ☐ No
b. Stroke: ☐ Yes ☐ No
c. Angina: ☐ Yes ☐ No
d. Heart failure: ☐ Yes ☐ No
e. Swelling in your legs or feet (not caused by walking): ☐ Yes ☐ No
f. Heart arrhythmia (heart beating irregularly): ☐ Yes ☐ No
g. High blood pressure: ☐ Yes ☐ No
h. Any other heart problem that you have been told about: ☐ Yes ☐ No

6. Have you **ever had** any of the following cardiovascular or heart symptoms?

a. Frequent pain or tightness in your chest: ☐ Yes ☐ No
b. Pain or tightness in your chest during physical activity: ☐ Yes ☐ No
c. Pain or tightness in your chest that interferes with your job: ☐ Yes ☐ No
d. In the past 2 years, have you noticed your heart skipping or missing a beat: ☐ Yes ☐ No
e. Heartburn or indigestion that isn't related to eating: ☐ Yes ☐ No
f. Any other symptoms that you think may be related to heart or circulation problems: ☐ Yes ☐ No

7. Do you **currently** take medication for any of the following problems?

a. Breathing or lung problems: ☐ Yes ☐ No
b. Heart trouble: ☐ Yes ☐ No
c. Blood pressure: ☐ Yes ☐ No
d. Seizures (fits): ☐ Yes ☐ No

8. If you have used a respirator, have you **ever had** any of the following problems? (If you have never used a respirator, check the following space and go to question 9:)

a. Eye irritation: ☐ Yes ☐ No
b. Skin allergies or rashes: ☐ Yes ☐ No
c. Anxiety: ☐ Yes ☐ No
d. General weakness or fatigue: ☐ Yes ☐ No
e. Any other problem that interferes with your use of a respirator? ☐ Yes ☐ No

9. Would you like to talk to the health care professional who will review this questionnaire about your answers? ☐ Yes ☐ No

Part 3-Additional Questions for Users of Full-facepiece Respirators or SCBAs
Please check "Yes" or "No"

1. Have you **ever lost** vision in either eye (temporarily or permanently): ☐ Yes ☐ No

2. Do you **currently** have any of these vision problems?

a. Need to wear contact lenses: ☐ Yes ☐ No
b. Need to wear glasses: ☐ Yes ☐ No
c. Color blindness: ☐ Yes ☐ No
d. Any other eye or vision problem: ☐ Yes ☐ No

3. Have you **ever had** an injury to your ears, including a broken ear drum: ☐ Yes ☐ No

4. Do you **currently** have any of these hearing problems?

a. Difficulty hearing: ☐ Yes ☐ No
b. Need to wear a hearing aid: ☐ Yes ☐ No
c. Any other hearing or ear problem: ☐ Yes ☐ No

5. Have you **ever had** a back injury: ☐ Yes ☐ No

6. Do you **currently** have any of the following musculoskeletal problems?

a. Weakness in any of your arms, hands, legs, or feet: ☐ Yes ☐ No
b. Back pain: ☐ Yes ☐ No
c. Difficulty fully moving your arms and legs: ☐ Yes ☐ No
d. Pain or stiffness when you lean forward or backward at the waist: ☐ Yes ☐ No
e. Difficulty fully moving your head up or down: ☐ Yes ☐ No
f. Difficulty fully moving your head side to side: ☐ Yes ☐ No
g. Difficulty bending at your knees: ☐ Yes ☐ No
h. Difficulty squatting to the ground: ☐ Yes ☐ No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs: ☐ Yes ☐ No
j. Any other muscle or skeletal problem that interferes with using a respirator: ☐ Yes ☐ No

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Part 4-Discretionary Questions

Complete questions in this part **only if** your employer's health care provider says they are necessary

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen? ☐ Yes ☐ No

If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions: ☐ Yes ☐ No

2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as, gases, fumes, or dust), **or** have you come into skin contact with hazardous chemicals? ☐ Yes ☐ No

If "yes," name the chemicals, if you know them:

_____

_____

3. Have you ever worked with any of the materials, or under any of the conditions, listed below:

a. Asbestos? ☐ Yes ☐ No
a. Silica (for example, in sandblasting)? ☐ Yes ☐ No
b. Tungsten/cobalt (for example, grinding or welding this material)? ☐ Yes ☐ No
c. Beryllium? ☐ Yes ☐ No
d. Aluminum? ☐ Yes ☐ No
e. Coal (for example, mining)? ☐ Yes ☐ No
f. Iron? ☐ Yes ☐ No
g. Tin? ☐ Yes ☐ No
h. Dusty environments? ☐ Yes ☐ No
i. Any other hazardous exposures? ☐ Yes ☐ No

If "yes," describe these exposures:

4. List any second jobs or side businesses you have:

_____

5. List your previous occupations:

_____

6. List your current and previous hobbies:

_____

7. Have you been in the military services? ☐ Yes ☐ No
If "yes," were you exposed to biological or chemical agents (either in training or combat)? ☐ Yes ☐ No

8. Have you ever worked on a HAZMAT team? ☐ Yes ☐ No

Part 4-Discretionary Questions (Continued)

9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)? ☐ Yes ☐ No

If "yes," name the medications if you know them:

_____

10. Will you be using any of the following items with your respirator(s)?

a. HEPA Filters: ☐ Yes ☐ No
b. Canisters (for example, gas masks): ☐ Yes ☐ No
c. Cartridges: ☐ Yes ☐ No

11. How often are you expected to use the respirator(s)?

a. Escape-only (no rescue): ☐ Yes ☐ No
b. Emergency rescue only: ☐ Yes ☐ No
c. Less than 5 hours **per week**: ☐ Yes ☐ No
d. Less than 2 hours **per day**: ☐ Yes ☐ No
e. 2 to 4 hours per day: ☐ Yes ☐ No
f. Over 4 hours per day: ☐ Yes ☐ No

12. During the period you are using the respirator(s), is your work effort:

a. **Light** (less than 200 kcal per hour): ☐ Yes ☐ No
If "yes," how long does this period last during the average shift: _____hrs. _____mins.

Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.

b. **Moderate** (200 to 350 kcal per hour): ☐ Yes ☐ No
If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.

c. **Heavy** (above 350 kcal per hour): ☐ Yes ☐ No
If "yes," how long does this period last during the average shift:_____hrs._____mins.

Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.)

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Part 4-Discretionary Questions (Continued)

13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator: _____ ☐ Yes ☐ No

If "yes," describe this protective clothing and/or equipment:

_____

14. Will you be working under hot conditions (temperature exceeding 77°F): _____ ☐ Yes ☐ No

15. Will you be working under humid conditions: _____ ☐ Yes ☐ No

16. Describe the work you will be doing while using your respirator(s):

_____

_____

17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases):

_____

_____

18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):

Name of the first toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____

Name of the second toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____

Name of the third toxic substance: _____
Estimated maximum exposure level per shift: _____
Duration of exposure per shift: _____

The name of any other toxic substances that you will be exposed to while using your respirator:

_____

19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well being of others (for example, rescue, security).

_____

_____

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WAC 296-842-22010

Follow these fit-testing procedures for tight-fitting respirators

Important:

- This section contains procedural requirements that apply during actual fit testing.
- See WAC 296-842-150 of this chapter for fit-testing requirements that apply to your overall program.

Exemption:

This section does not apply to employees who:

– Voluntarily use respirators

or

– Are required to use mouthpiece respirators.

(1) Follow the procedure in Table 11 to choose a respirator for fit testing:

(a) Prior to conducting fit tests

and

(b) Any time your employee must select a different respirator such as when a previously selected respirator fails a test

(2) Select and follow at least one of the following fit test procedures:

(a) Qualitative fit-test procedures:

- Isoamyl acetate vapor (IAA, banana oil) in Table 12
- Saccharine aerosol in Table 13
- Bitrex™ aerosol in Table 14
- Irritant smoke in Table 15

(b) Quantitative fit-test procedures:

- Ambient aerosol condensation nuclei counter such as the Portacount™, in Table 16
- Controlled negative pressure (CNP) such as the FitTester 3000™, in Table 17
- Generated aerosol in Table 18

– Continued–

Required Procedures for Respiratory Protection Program

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WAC 296-842-22010 (Continued)

(3) Make sure employees perform the appropriate fit test exercises listed in Table 19.

(4) Clean and maintain equipment according to the manufacturer's instructions.

(5) Make sure during fit testing employees wear any safety equipment that could:

(a) Interfere with respirator fit

and

(b) Be worn in the workplace. For example, chemical splash goggles.

(6) Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If you find such conditions, do not conduct fit testing for that individual.

Note:

Examples of conditions that may interfere with the respirator seal or valve functions include:

- Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function
- Temple bars of corrective eyewear or headgear that extend through the face seal area.

– Continued–

WAC 296-842-22010 (Continued)

Table 11
Procedure for Choosing a Respirator for Fit Testing

1. **Inform** the employee:

- To choose the most comfortable respirator that provides an adequate fit
- That each respirator sample represents a different size and, if more than one model is supplied, a different shape
- That if fitted and used properly, the respirator chosen will provide adequate protection

2. **Provide** a mirror and show the employee how to:

- Put on the respirator
- Position the respirator on the face
- Set strap tension

Note:
This instruction doesn't take the place of the employee's formal training since it is only a review.

3. **Review** with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.

- Tell the employee the respirator should be comfortable while talking or wearing eye protection.

4. **Have the employee** hold each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:

- Reject any facepiece that clearly doesn't feel comfortable or fit adequately
  or
- Choose which facepiece is most acceptable and which are less acceptable, if any

Note:

- ➢ Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that is acceptable and fits correctly.
- ➢ To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later.

Table 11 (Continued)
Procedure for Choosing a Respirator for Fit Testing

5. **Have the employee wear** the most acceptable respirator for **at least** 5 minutes to evaluate comfort and fit. Do **all** of the following during this time:

   - Ask the employee to observe and comment about the comfort and fit:
     - Around the nose, cheeks, and other areas on the face
     - When talking or wearing eye protection.
   - Have the employee put on the respirator and adjust the straps until they show proficiency.
   - Evaluate the respirator's general fit by checking:
     - Proper chin placement
     - Properly tightened straps (do **not** over tighten)
     - Acceptable fit across the nose bridge
     - Respirator size; it must span the distance from nose to chin
     - To see if the respirator stays in position
   - Have the employee complete a successful seal check as specified in WAC 296-842- 22025 of this chapter
     - Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths while **slowly:**
       - Moving their head from side-to-side
         and
       - Up and down

6. **If the employee finds the respirator unacceptable**, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.

7. **Before starting the fit test**, you must:

   - Describe the fit test including screening procedures, employee responsibilities, and test exercises
     and
   - Make sure the employee wears the respirator **at least** 5 minutes

Table 12
Isoamyl Acetate (Banana Oil) Vapor Test Procedure

Important:

- This is a qualitative fit-test (QLFT) procedure.
- The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor.
  - Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this:
    - Prepare **all** solutions in a location separate from screening and test areas.
    - Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air.
  - Always use odor-free water, for example, distilled or spring water that is 25°C (77°F).
- Isoamyl acetate is also known as isopentyl acetate.

Screening Preparations

Important:

Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.

1. Choose an appropriate location to conduct screening.
- Conduct screening and tests in separate well-ventilated rooms.

2. Prepare a stock solution **at least** weekly as follows:

- Add one milliliter (ml) of pure IAA to 800 ml of odor free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette.
- Seal the jar with the lid and shake it for 30 seconds.
- Clean the dropper or pipette

3. Prepare the odor test solution daily as follows:

- Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper
- Seal the jar with the lid and shake it for 30 seconds.
- Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium.
- Label this jar so you know the contents but the employee cannot know its contents, for example, "1."

Note:
To maintain the integrity of the test, use labels that peel off easily **and** periodically switch the labels.

Table 12 (Continued) Isoamyl Acetate (Banana Oil) Vapor Test Procedure
Screening Preparations (Continued)
4. Prepare a "test blank" solution as follows: • Add 500 ml of odor-free water to a one liter glass jar with a metal lid • Seal the jar • Label the jar so you know the contents but the employee cannot know its contents **5.** Type or neatly print the following instructions on a card and place it on the table in front of the 2 test jars: *"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one contains a small amount of banana oil.* *Make sure the lid is secure then pick up a jar and shake it for 2 seconds. Open the jar and sniff at the opening. Repeat this for the second jar.* *Tell the individual conducting the fit test which jar contains banana oil. "*
Test Preparations
6. Choose an appropriate location to conduct fit testing. • Conduct screening and tests in separate well-ventilated rooms. **7.** Assemble the fit test enclosure in the room. • Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other lightweight rigid material **or** construct a similar enclosure using plastic sheeting. • Hang the frame with the plastic covering so the top of the enclosure is about 6 inches above the employee's head. • Attach a small hook inside top center of the enclosure. • Tape a copy of the test exercises (see Table 19) to the inside of the test enclosure where the employee can read it. **8.** Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator. **9.** Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material **and** 0.75 ml of pure IAA. Do **not** apply IAA yet. **Note:** As an alternative to using the paper towel, you may use an IAA test swab **or** ampoule if it has been demonstrated to generate an equivalent test concentration.

Table 12 (Continued) Isoamyl Acetate (Banana Oil) Vapor Test Procedure
Screening
10. Have the employee, while **not** wearing a respirator, follow the instructions on the card provided. • If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11). • If the employee is **not** able to correctly identify the jar containing IAA, you must **stop** and use a different fit test protocol.
Test

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Table 13 Saccharin Aerosol Test Procedure
Screening Preparations

Important:

- This is a qualitative fit-test (QLFT) procedure.
- Taste threshold screening determines whether the employee being tested can detect the taste of saccharin.

¨Ô 7{cÅc ¦ ¸¢®çccÅ ¦ âÐÙÖ**not** eat, smoke, chew gum or drink anything but plain water for at least 15 minutes **before** the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening.

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- Each morning and afternoon
  or
- At least every 4 hours

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1. Obtain a test enclosure (hood) that meets the following specifications:

- 12 inches in diameter by 14 inches tall
- A clear front portion
- Enough space inside to allow free movement of the head when a respirator is worn
- A ¾ i inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.

Note:

- ➢ An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications.
- ➢ This enclosure can also be used for testing.

2. Obtain and assemble 2 clean DeVilbiss Model 40 Inhalation Medication Nebulizers **or** equivalent.

3. Prepare the screening solution as follows:

- Dissolve 830.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water
  or
- If you have already prepared the fit test solution, you can make the screening solution by adding one ml of this solution to 100 ml of distilled water.

4. Add about 1 ml of the screening solution to one of the nebulizers.

- Mark this nebulizer to distinguish it from the one to be used for fit testing.

Table 13 (Continued) Saccharin Aerosol Test Procedure
Test Preparations
5. Prepare the fit test solution as follows: • Add 83.0 grams of sodium saccharin to 100 ml of warm water. **6.** Add about 1 ml of the test solution to the second nebulizer. • Mark this nebulizer to distinguish it from the one used for screening. **7.** Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.
Screening
8. Have the employee, while **not** wearing a respirator, put on the test enclosure **9.** Instruct the employee to: • Breath through a slightly open mouth with tongue extended during screening **and** testing • Immediately report when a sweet taste is detected **10.** Insert the nebulizer into the front hole of the test enclosure **and** administer saccharin as follows: • Direct the nozzle away from the employee's nose and mouth • Complete 10 squeezes in rapid succession. • Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand. **11.** Ask the employee if a sweet taste is detected. • If **yes**, screening is completed. Proceed to conduct testing, Step 14, **after** you: - Ask the employee to remember the taste for reference during the fit test. - Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed. • If **no**, screening must continue. Proceed to Step 12. **12.** Repeat with 10 more squeezes. Then follow Step 11 again; **except** this time note the employee's taste threshold as "20" **if** a sweet taste is reported. • If a sweet taste is still **not** detected, repeat with 10 more squeezes and follow Step 11 one last time; **except** this time note "30" for the taste threshold **if** a sweet taste is reported. **13.** If **no** sweet taste is reported after 30 squeezes, you must **stop** and choose a different fit test protocol for the employee.

Table 13 (Continued) Saccharin Aerosol Test Procedure
Test
Important: • Periodically check nebulizers to make sure they do not clog during use. A test is **not** valid if the nebulizer is clogged at the end of the test. **14.** Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood). **15.** Instruct the employee to immediately report if a sweet taste is detected. **16.** Insert the nebulizer into the front hole of the test enclosure **and** administer the same number of squeezes, either 10, 20, or 30, as noted during screening. **17.** Have the employee perform the appropriate fit test exercises as described in Table 19. During this step: • Replenish the aerosol in the hood **every** 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15. • The employee must report if a sweet taste is detected: - If **no** saccharin is tasted, the test has been **passed**. • If saccharin is tasted the test has **failed**, have the employee select another respirator **and** • Repeat screening and testing

Table 14
!~ÛÏcè™ Aerosol Test Procedure

Important:

- This is a qualitative fit-test (QLFT) procedure.

P! ~Ù Íc æ ºZc«?Ù®«~â ¦ ÛGc«é®?Ùc»Û-ÐÛÍ®âÙ~«c¢çÛâÐcZÛ?ÐÛ?ÛÙ?Ðc Ûc Û?äcÍÐ~®«Û?sc«ÙÛ~«Û{®âÐc{®¢ZÛ¢-Ââ-ZÐÛÙ{?ÙÛQ{~¢ZÍc«Û should not drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers.

- The employee must **not** eat, smoke, chew gum or drink anything but plain water for at least 15 minutes **before** the fit test.

Screening Preparations

Important:

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- Nebulizers must be thoroughly rinsed in water and shaken dry:
  - Each morning and afternoon
    or
  - At least every 4 hours
- You may use commercially prepared solutions if they meet the requirements in this procedure.

1. Obtain a test enclosure that meets the following specifications:

- 12 inches in diameter by 14 inches tall
- A clear front portion
- Enough space inside the front to allow free movement of the head when a respirator is worn
- ¾ inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth.

Note:

- ➢ An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications.
- ➢ This enclosure can also be used for testing.

2. Obtain and assemble 2 clean DeVilbiss Model 40 Inhalation Medication Nebulizers **or** equivalent:

3. Prepare the screening solution as follows:

- Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water

P #-ÐÐ®¢äcÛ±Û¼nÛ ¦ ~¢~sÍ? ¦ Ð Û®Ù! ~ÙÍcæÛ-«ÛÙ{cÛÐ?¢ÙÛÐ®¢âÙ~®«¼Û

4. Add about 1 ml of the screening solution to one of the nebulizers.

- Mark this nebulizer to distinguish it from the one to be used for fit testing.

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Table 14 (Continued) !~ÛÏcè™ Aerosol Test Procedure
Test Preparations
5. Prepare the fit test solution. • Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water PÛ ZZÛÛÛÓ½nÛ ¦ ~¢¢-sÍ? ¦ ÐÛ®lÛ ! ~ÙÍcæÛÙ®ÛÙ{cÛå?Í ¦ cZÛÐ?¢ÙÛÐ®¢âÙ~®«½
6. Add about 1 ml of the test solution to the second nebulizer. • Mark this nebulizer to distinguish it from the one used for screening.
7. Have particulate filters ready for the employee's chosen respirator or have filtering facepiece respirators ready.
Screening
Important: The employee must **not** eat, smoke, chew gum or drink anything but plain water for at least 15 minutes **before** the screening and test.
8. Have the employee, while **not** wearing a respirator, put on the test enclosure.
9. Instruct the employee to: • Breath through a slightly opened mouth with tongue extended during screening **and** testing • Immediately report when a bitter taste is detected
10. Insert the nebulizer into the front hole of the test enclosure **and**Û?Z ¦ ~«~ÐÙcÍÛ ! ~ÙÍcæÛ?ÐÛl®¢¢®åÐV • Direct the nozzle away from the employee's nose and mouth • Complete 10 squeezes in rapid succession. • Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand.
11. Ask the employee whether a bitter taste is detected. • If **yes**, screening is completed. Proceed to conduct testing, Step 14, **after** you: - Ask the employee to remember the taste for reference during the fit test. - Note the employee's taste threshold as "10", regardless of the number of squeezes actually completed. • If **no**, screening must continue. Proceed to Step 12.
12. Repeat with 10 more squeezes. Then follow Step 11 again; **except** this time note the employee's taste threshold as "20" **if** a bitter taste is reported. • If a bitter taste is still **not** detected repeat with 10 more squeezes and follow Step 11 one last time; **except** this time note "30" for the taste threshold **if** a bitter taste is reported.
13. If **no** bitter taste is reported after 30 squeezes, **stop** and choose a different fit test protocol for the employee.

Table 14 (Continued) !~ÛÏcè™ Aerosol Test Procedure
Test
14. Have the employee attach respirator filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure. **15.** Instruct the employee to: • Breath through a slightly opened mouth with tongue extended during screening **and** testing • Immediately report when a bitter taste is detected **16.** Insert the nebulizer into the front hole of the test enclosure **and** administer the same number of squeezes, either 10, 20, or 30, as noted during screening. **17.** Have the employee perform the appropriate fit test exercises as described in Table 19. During this step: • Replenish the aerosol in the hood **every** 30 seconds using ½ the number of squeezes used in Step 16, either 5, 10, or 15. • The employee must report if a bitter taste is detected: - If **no**Ô!~ÙÍcæÔ-ÐÛÙ?ÐÙcZÙÙ{cÛÙcÐÙÛ{?ÐÔGcc« **passed**. |Ô)IÔ!~ÙÍcæÔ-ÐÛÙ?ÐÙcZÛÙ{cÛÙcÐÙÛ{?ÐÔ**failed**. Have the employee: • Select another respirator **and** • Repeat all screening and testing steps

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Table 15 Irritant Smoke (Stannic Chloride) Test Procedure
Important: **Do not use a test enclosure or hood for this fit test!** • This is a qualitative fit-test (QLFT) procedure. • During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages. • Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke. • Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.
Screening and Test Preparations
Important: Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke **and** whether any gross facepiece leakage is detected. **1.** Obtain only stannic chloride (ventilation) smoke tubes, **and** an aspirator squeeze bulb **or** use a low flow air pump set to deliver 200 milliliters of air flow per minute. **2.** Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high efficiency particulate air (HEPA) filters.
Screening
Important: When performing sensitivity screening checks use only the **minimum** amount of smoke necessary to elicit a response from the employee. **3.** Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages **and** instruct the employee to keep eyes closed while exposed. **4.** Break both ends of the ventilation smoke tube **and** fit a short piece of plastic tubing, for example, 2-to-6 inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute. **5.** While the employee is **not** wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties. • Carefully direct a small amount of irritant smoke toward the employee.

Table 15 (Continued) Irritant Smoke (Stannic Chloride) Test Procedure
Test
6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks. **7.** Remind the employee to keep eyes closed during testing. **8.** Direct a stream of irritant smoke toward the respirator's face seal area as follows: • Begin at least 12 inches from the facepiece and move the smoke around the whole perimeter of the mask. • Gradually make 2 more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator. • **Stop** at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening. **9.** Have the employee perform appropriate fit test exercises in Table 19 if the employee has **not** had an involuntary response such as evidence of coughing, flinching, or other response, or detected smoke in the facepiece. • Continue to direct smoke from a distance of 6 inches around the facepiece perimeter. - If smoke is detected at any time the test has failed. A different respirator must be chosen and tested, starting with sensitivity screening. - If no smoke is detected proceed to Step 10. **10.** Have the employee remove the respirator and perform another sensitivity screening check as follows: • Continue to use the smoke tube used for fit testing. • Carefully direct a **small** amount of irritant smoke toward the employee. - The test has been passed if the employee responds to the smoke. The fit test is voided **if** the employee does **not** respond to the smoke.

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Table 16 §G~c¬Ûø cÏ°Ò°£Ø"°¬Zc¬Ò?Û~°¬Ø/äQ£c~Ø"°ä¬ÛcÏ℅3°ÏÙ?Q°ä¬Ù™) **Test Procedure**
Important: • This is a quantitative (QNFT) fit-test procedure. • This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises. • Particles in the ambient air are used as the test aerosol.
Test Preparations
1. Û OGÙ?~«Û?ÖÙcÐÙÛ~«ÐÙÍâ ¦ c«ÙÖÐâQ{Û?ÐÛ?Û3®ÍÙ?Q®â«Ù™. **2.** Have probed respirators available for each respirator model and size the employer uses, **or** have a sampling adapter available if the employee's actual or chosen respirator will be tested. **Note:** ➢ A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, **and** can only be used for fit testing purposes. ➢ Contact TSI Inc., **or** the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters. **3.** Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass **or** fail criterion is programmed to the following **minimum** performance levels: • For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level. • For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level. **4.** Have high efficiency particulate air (HEPA) filters, **or** other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters. • If you will use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.

Required Proecdures

Table 16 (Continued)
§G-c¬Ûø cÏ°Ò°£Ø"°¬Zc¬Ô?Ù~°¬Ø/äQ£c~Ø"°ä¬ÛcÏØ¼3°ÏÙ?Q°ä¬Û™)
Test Procedure

Test
5. Properly attach the sampling line to the facepiece probe or sampling adapter.
6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator 5 minutes **before** the fit test. During this time you and the employee must evaluate the respirator's general fit by checking: • Proper chin placement • Properly tightened straps (do **not** over tighten) • Acceptable fit across the nose bridge • Respirator size. It must span the distance from nose to chin • To see if the respirator stays in position **Note:** Wearing the respirator for 5 minutes permits the employee to make certain the respirator is comfortable **and** allows for purging of ambient particles trapped inside the facepiece.
7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If **no** leakage is detected proceed to Step 8. If leakage is detected: • Determine the cause **and** • If leakage is due to a poorly fitting facepiece have the employee: - Choose another respirator size or model **and** - Start again at Step 6.
8. Start the fit test cycle. • Follow the manufacturer's instructions for operating the test instrument. • Have the employee perform the appropriate fit test exercises in Table 19. - The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed. • The test has been **passed** if the overall fit factor is at least 100 for a half facepiece, **or** 500 for a full facepiece. • The test has **failed** if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece. **Note:** If the test has failed, have the employee select another respirator model or size following Table 11 **and** repeat this procedure.

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Table 17 Controlled Negative Pressure (CNP) Test Procedure
Important: • This is a quantitative fit-test (QNFT) procedure. • This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure **after** various premeasurement activities. • Instruments used must have a nonadjustable test pressure of 15.0 mm water pressure. • Measurements occur while employees remain still **and** hold their breath for 10 seconds. • No test aerosols are used. Respirator cartridges are not needed for this test. Sampling manifolds that replace the filter cartridges are available from the instrument manufacturer, and allow fit testing of an employee's own respirator.
Test Preparations
1. Make sure the individual conducting the fit test is thoroughly trained to perform this test. **2.**ů OGů?-«ů?ů" / 3ůůcĐůů-«ĐůÍâ ¦ c«ůůĐâQ{ů?Đů?ů&~ů7cĐůcÍůÛêêêß¾ůů . ?¡cůĐâÍcv • Defaults are set at: - 15mm (-0.58 inches) of water test pressure **and** - A modeled inspiratory flow rate of 53.8 liters per minute • It has an effective audio warning device that signals when employees fail to hold their breath **Note:** ➢ You are not required to obtain test recording and printing equipment such as computers **or** printers. Hand recording results is acceptable. ➢ To see default settings, check the instrument's "REDON protocol" to see default settings. **3.** Obtain facepiece adapters appropriate for each test respirator. **Note:** ➢ Adapters are either a one-piece (for SCBA facepieces), **or** 2-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure. ➢ To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, **or** the respirator manufacturer.

Table 17 (Continued)
Controlled Negative Pressure (CNP) Test Procedure

Test
Important: The respirator must not be adjusted once the fit-test exercises begin. Any adjustment voids the test and the test must be repeated. After the test, you must ask the employee about the comfort of the respirator **and** if the respirator has become unacceptable, another size or model must chosen and tested. **4.** Explain the test procedure to the employee. **5.** Train the employee on how to hold a breath for at least 10 seconds. **6.** Prepare the respirator for the fit test as follows: • Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it. • Replace cartridges, if present, with the manifold and breathing valve adapter - For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve attachment. • Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions. **7.** Have the employee put on, adjust, and seal check the respirator without assistance. **8.** Turn on the instrument **and** have the employee stand and perform the fit test exercises in Table 19. **9.** Once test exercises are completed ask the employee about facepiece comfort. If the employee states the respirator is unacceptable, repeat the fit test using another model. **10.** Determine the overall fit factor for each employee by calculating the harmonic mean of the fit-testing as follows: • Overall fit factor = $\frac{n}{1/ffE1 .+ 1/ffE2 .+ 1/ffE3 . . . .+ 1/ffEn}$ • The test is **passed** if the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece. • The test has **failed** if the fit factor is less than 100 for a half facepiece; 500 for a full facepiece. - If the test has failed you must have the employee select another respirator model or size following the steps in Table 11 **and** repeat this procedure, starting at Step 6.

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Table 18 Generated Aerosol Test Procedure
Important: • This is a quantitative (QNFT) fit-test procedure. • In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises. • Special equipment is needed to generate, disperse, detect, and measure test aerosols.
Test Preparations
1. Test aerosol. • Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride. **2.** Instrumentation. • Do **all** the following: - Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates. - Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation. - Select a sampling instrument that allows for a computer record or strip chart record to be created. • The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000. **Note:** Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made. - Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line. **3.** Test enclosure. • Do **all** the following: - Make sure the enclosure is equipped and constructed to effectively: • Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow **all** employees freedom of movement during testing **without** disturbing the test concentration or measurement instrument. • Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air. • Allow the individual conducting the fit test to view the employee during the test. - Make sure the tubing used to collect samples from the enclosure **and** respirator is the same material, diameter, **and** length. This makes the effect of aerosol loss caused by deposition in each sample line equal. - If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.

Table 18 (Continued)
Generated Aerosol Test Procedure

Test Preparation

4. Prepare test respirators.
- Do **all** the following:
  - Inspect test respirators regularly for missing parts **and** damage
  - Keep test respirators in proper working order
  - Make sure in-mask sampling probes are:
    - Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth
      and
    - The probe extends inside the facepiece at least ¼ inch.
  - Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do **not**:
    - Block air flow into the sampling line
    - Leak
    - Interfere with the respirator's fit or performance
- Have high efficiency particulate air (HEPA) filters OR P100 series filter available.
  - Replace filters when increased breathing resistance is detected **or** when the test agent has altered the filter material's integrity.

Test

Important:
- Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration.
- If a single peak penetration exceeds 5% for half facepieces **or** 1% for full facepieces:
  - Stop the test
    and
  - Have the employee select another respirator for testing.

5. Have the employee attach filters, put on, adjust, and seal check the respirator.
- Be sure to crimp the sampling line to avoid pressure leaks during the seal check.
  and
- Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do **not** over-tighten.

6. **Optional Step**. To save time conduct a screening test to quickly identify poorly fitting respirators

Note:
You may use a qualitative screening test **or** an ambient aerosol condensation nuclei counter instrument in the count mode.

Table 18 (Continued)
Generated Aerosol Test Procedure

Test (Continued)

7. Make sure test aerosol concentration is reasonably stable.
- If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **after** the employee enters the enclosure.

8. Have the employee enter the test enclosure and connect the respirator to the sample lines.

9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.
- Make sure the peak penetration does **not** exceed 5% for half facepieces, **or** 1% for full facepieces.

10. Have employee perform the appropriate fit test exercises in Table 19.
- Do **not** adjust the respirator once exercises begin.

11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:
- **Passed** if the minimum fit factor of 100 for half facepieces or 500 for full facepieces is obtained.
  or
- IF a passing fit factor is **not** obtained, the test has **failed** and you must have the employee select and test another respirator.

Calculations

Important:
- Do **not** count the grimace exercise measurements during these calculations.
- Take into account the limitations of instrument detection when determining fit factors.

12. Calculate individual fit factors for **each** exercise by applying the following:

$$\text{Exercise Fit Factor (ffE)} = \frac{\text{Average test enclosure concentration}}{\text{Test aerosol concentration inside the respirator}}$$

- To determine the average test enclosure concentration use one of the following methods:
  - Arithmetic average of the concentration before and after each test (an average of 2 values per entire test)
  - Arithmetic average of concentration before and after each exercise (an average of 2 values per exercise).
  - True average measured continuously during the respirator sample
- Determine the test aerosol concentration inside the respirator in one of the following ways:
  - Average peak penetration values. Determine aerosol penetration for each exercise by:
    - Using integrators or computers that calculate the actual test agent penetration
      or
    - Average the peak heights shown on the strip chart recording, graph, or by computer integration.
  - Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value.
  - Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.

13. Using individual exercise fit factors (ffE) calculate the overall fit factor by doing **all** of the following:
- Convert each exercise fit factor to a penetration value
- Determine the average penetration value
- Convert the average penetration value back to a fit factor
  or
- Use this equation to calculate the **overall fit factor**:

$$\text{Overall fit factor} = \frac{n}{1/ffE1 .+ 1/ffE2 .+ 1/ffE3 \ldots .+ 1/ffEn}$$

Table 19
Fit Test Exercises

Important:

- This list applies when you use any fit test.
- Employees tested must perform **all** exercises marked with an "X" as described for the fit test procedure used.
  - ¨Ô O«QcÛcæcÍQ-ÐcÐÛGcs~«ìÛ?«çÛ?Z âÐÙ ¦ c«ÙÐÔ ¦ ?ZcÛä®~ZÛÙ{cÛÙcÐÙÛ**and** you must begin again.
  - ¨Ô lÙcÍÛÙcÐÙÛcæcÍQ~ÐcÐÛ?ÍcÛQ® ¦ ¸¢cÙcZìÛÛç®âÛ ¦ âÐÙÛ?Ð¡ÛÙ{cÛc ¦ ¸¢®çccÛ?G®âÙÛÙ{cÛQ® ¦ l®ÍÙÛ®lÛÙ{cÛÍcÐ¸~Í?Ù®Íìûû)lÛ~Ù0{?ÐÔ become unacceptable, have the employee choose another one for testing.
- When the Controlled Negative Pressure Procedure (CNPP) is used **stop and repeat** the test if the employee adjusts the respirator **or** takes a breath and fails to hold it for 10 seconds.
- Controlled negative pressure tests conducted according to the method published in 29 CFR 1910.134, Appendix A are an acceptable alternative to the method outlined below.

Description of Required Fit Test Exercises	Fit Test Procedures		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
Normal breathing • Breathe normally, while standing for one minute	X	X	
Deep breathing • Breathe slowly and deeply while standing for one minute. • Take caution to avoid hyperventilating	X	X	
Head side to side • Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale. • Be careful to **not** bump the respirator	X	X	
Head up and down • Slowly move head up and down while standing for one minute, inhaling in the up position. • Be careful to **not** bump the respirator.	X	X	

Table 19 (Continued) Fit Test Exercises			
Description of Required Fit Test Exercises	**Fit Test Procedures**		
	Qualitative Procedures	**Quantitative Procedures; EXCEPT the CNPP**	**Controlled Negative Pressure Procedure (CNPP)**
Talking • Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose **one** of the following: ¨Ô 5c?ZÛIÍ® ¦ Ô?Ô¸Íc¸?ÍcZÛÙcæÙÛÐâQ{Ô?ÐÛ{c **Rainbow Passage*** ¨Ô "®â«ÙÛG?Q¡å?ÍZÛIÍ® ¦ Ô±êê ¨Ô 5cQ-Ùcû?Ô ¦ c ¦ ®Í-écZÔ¸®c ¦ Ô®ÍÛÐ®«s	X	X	
Grimace • Smile or frown for 15 seconds		X	
Bending over • Bend over to touch toes while standing. Repeat at a comfortable pace for one minute **or** • Jog in place for one minute if the test enclosure, such as a hood, doesn't permit bending over	X	X	
Normal breathing - Breathe normally while standing for one minute	X	X	
Face forward • **Premeasurement activity:** Stand and breath normally, without talking, for 30 seconds • **Measurement position:** Face forward while holding breath for 10 seconds			X
Bending over • **Premeasurement activity:** While standing, bend at the waist, as if to touch toes • **Measurement position:** Hold the bending position with face parallel to the floor while holding breath for 10 seconds			X

Table 19 (Continued) Fit Test Exercises			
Description of Required Fit Test Exercises	**Fit Test Procedures**		
	Qualitative Procedures	**Quantitative Procedures; EXCEPT the CNPP**	**Controlled Negative Pressure Procedure (CNPP)**
Head shaking • **Premeasurement activity:** Vigorously shake head from side to side for about 3 seconds while shouting • **Measurement position:** Face forward, while holding breath for 10 seconds			X
Redon-1 • **Premeasurement activity:** Loosen all facepiece straps and remove the respirator completely, then put it back on • **Measurement position:** Face forward while holding breath for 10 seconds			X
Redon-2 • Repeat the premeasurement activity and measurement position described in Redon-1			X

*__The Rainbow Passage__:

"*When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow.*"

Required Procedures for Respiratory Protection Program

Chapter 296-842 WAC

Rule

WAC 296-842-22015

Follow procedures established for cleaning and disinfecting respirators

- Follow the procedure in Table 20 for cleaning and disinfecting respirators.

Table 20
Respirator Cleaning Procedure

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. • Discard or repair any defective parts.
2.	Wash components in warm (43°C [110°F] maximum) water with a mild detergent or with a cleaner recommended by the manufacturer. • A stiff bristle (not wire) brush may be used to help remove the dirt. • If the detergent or cleaner doesn't contain a disinfecting agent, respirator components should be immersed for 2 minutes in one of the following: - A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F) - A solution of iodine (50 parts per million iodine). Make this in 2 steps: • First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately. • Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution. - Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer
3.	Rinse components thoroughly in clean, warm (43°C [110°F] maximum), preferably, running water. **Note:** The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	Reassemble the facepiece components. • Replace filters, cartridges, and canisters, if necessary (for testing)
7.	Test the respirator to make sure all components work properly.

Required Procedures for Respiratory Protection Program

Chapter 296-842 WAC

Rule

WAC 296-842-22020

Follow procedures established for seal checking respirators

Important:

- User seal checks are **not** a substitute for fit tests. See WAC 296-842-22010 for fit test procedures.
- You may use a seal check procedure recommended by the respirator manufacturer **instead** of the procedure outlined in Table 21 **if** you can demonstrate the procedure is based on a scientific study that, for example, demonstrates the procedure effectively identifies respirators that fit poorly when put on or adjusted.
- Make sure employees perform a user seal check as outlined in Table 21, **each time** the respirator is worn, to make sure the seal is adequate.

Required Procedures

– Continued–

Required Procedures for Respiratory Protection Program

Chapter 296-842 WAC

Rule

WAC 296-842-22020 (Continued)

Table 21
User Seal Check Procedure

Important Information for Employees:

- You need to conduct a seal check each time you put your respirator on before you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems.
- The procedure below has 2 parts; a positive pressure check and a negative pressure check. You must complete both parts each time. It should only take a few seconds to perform, once you learn it.
  - If you cannot pass both parts, your respirator is not functioning properly, see your supervisor for further instruction.

Positive Pressure Check:

1. Remove exhalation valve cover, if removable.

2. Cover the exhalation valve completely with the palm of your hand while exhaling gently to inflate the facepiece slightly.

3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and no outward leakage).

- If you detect no leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check .
- If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.

Negative Pressure Check:

4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands while inhaling gently to collapse the facepiece slightly.

- If you cannot use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use:
  - Filter seal(s) (if available)

    or
  - Thin rubber gloves

5. Once the facepiece is collapsed, hold your breath for 10 seconds **while** keeping the inhalation openings covered.

6. The facepiece should remain slightly collapsed (indicating negative pressure and **no** inward leakage).

- If you detect **no** evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator.
- If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat **both** the positive and negative fit checks.

Notes

Respirators

Chapter 296-842 WAC

Definitions

WAC 296-842-300

The following definitions apply to this chapter:

Air-purifying respirator (APR)

- A respirator equipped with an air-purifying element such as a filter, cartridge, or canister, **or** having a filtering facepiece, for example, a dust mask.
- The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air that passes through it.

Air-line respirator

- An atmosphere-supplying respirator for which breathing air is drawn from a source separate from and not worn by the user, such as:
  - A cylinder or a tank
  - A compressor
  - An uncontaminated environment.

Air supplied respirator (see air-line respirator)

Assigned protection factor (APF)

- Indicates the workplace level of respiratory protection that a respirator or class of respirators is expected to provide to employees when you implement a continuing, effective respiratory protection program as specified by this chapter. For example, an effective program makes sure the respirator is:
  - Functioning properly

    and
  - Fitted to the user

    and
  - Worn by trained individuals

    and
  - Used with the limitations specified on the NIOSH approval label.

Respirators

Chapter 296-842 WAC

Definitions

Atmosphere-supplying respirator

- A respirator that supplies the user with breathing air from sources, such as:
- A cylinder or a tank
- A compressor
- An uncontaminated environment.

Breathing air

Air supplied to an atmosphere-supplying respirator. This air meets the specifications found in WAC 296-842-200.

Canister or cartridge (air-purifying)

Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

Cartridge respirator (see also air-purifying respirator)

An air-purifying respirator equipped with one or more cartridges. These respirators have a facepiece made from silicone, rubber **or** other plastic-like materials.

Demand respirator

An atmosphere-supplying respirator that sends breathing air to the facepiece only when suction (negative pressure) is created inside the facepiece by inhalation. Demand respirators are "**negative pressure**" respirators.

Dust mask

A name used to refer to filtering-facepiece respirators. Dust masks may or may not be NIOSH certified. See filtering facepiece.

Emergency respirator

Respirators suitable for rescue, escape, or other activities during emergency situations.

Definitions

Emergency situation

Any occurrence that could **or** does result in a significant uncontrolled release of an airborne contaminant. Causes of emergency situations include, but aren't limited to, equipment failure, rupture of containers, or failure of control equipment.

End-of-service-life indicator (ESLI)

A system that warns the air-purifying respirator user that cartridges or canisters must be changed. An example of an ESLI is a dot on the respirator cartridge that changes color.

Escape-only respirator

A respirator that can only be used to exit during emergencies. Look for this use limitation on the respirator's NIOSH approval label.

Exposed, or exposure

The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

Filter

Fibrous material that removes dust, spray, mist, fume, fog, smoke particles, **or** other aerosols from the air.

Filtering-facepiece respirator

A tight-fitting, half-facepiece, negative-pressure, particulate air-purifying respirator with the facepiece **mainly** composed of filter material. These respirators don't use cartridges or canisters and may have sealing surfaces composed of rubber, silicone or other plastic-like materials. They are sometimes referred to as "dust masks."

Fit factor

A number providing an estimate of fit for a particular respiratory inlet covering to a specific individual during quantitative fit testing.

Fit test (see also qualitative fit test and quantitative fit test)

Fit testing is an activity where the facepiece seal of a respirator is challenged, using a WISHA accepted procedure, to determine if the respirator provides an adequate seal.

Respirators

Chapter 296-842 WAC

Definitions

Full-facepiece respirator

A tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

Gas mask

An air-purifying respirator equipped with one or more canisters. These respirators have a facepiece made from silicone, rubber or other plastic-like materials.

Half-facepiece respirator

A tight-fitting respirator that only covers the wearer's nose and mouth.

Helmet

The rigid part of a respirator that covers the wearer's head **and** also provides head protection against impact or penetration.

High-efficiency particulate air filter (HEPA)

A powered air purifying respirator (PAPR) filter that removes at least 99.97% of monodisperse dioctyl phthalate (DOP) particles with a mean particle diameter of 0.3 micrometer from contaminated air.

Note:
Filters designated, under 42 CFR Part 84, as an "N100," "R100," or "P100" provide the same filter efficiency (99.97%) as HEPA filters.

Hood

The part of a respirator that completely covers the wearer's head and neck and may also cover some or all of the shoulders and torso.

Definitions

Immediately dangerous to life or health (IDLH)

An atmospheric condition that would:

- Cause an immediate threat to life

  or

- Cause permanent or delayed adverse health effects

  or

- Interfere with an employee's ability to escape.

Licensed health care professional (LHCP)

An individual whose legally permitted scope of medical practice allows him or her to provide **some or all** of the health care services required for respirator users' medical evaluations.

Loose-fitting facepiece

A respiratory inlet covering that is designed to form a partial seal with the face.

Negative-pressure respirator

Any tight-fitting respirator in which the air pressure inside the facepiece is less than the air pressure outside the respirator during inhalation.

NIOSH

The National Institute for Occupational Safety and Health. NIOSH is the federal agency that certifies respirators for occupational use.

Oxygen deficient

An atmosphere with an oxygen content below 19.5% by volume.

Permissible exposure limit (PEL)

Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA rules.

Respirators

Chapter 296-842 WAC

Definitions

Positive-pressure respirator

A respirator in which the air pressure inside the respiratory-inlet covering is greater than the air pressure outside the respirator.

Powered air-purifying respirators (PAPRs)

An air-purifying respirator equipped with a blower that draws ambient air through cartridges or canisters. These respirators, as a group, are **not** classified as positive pressure respirators and must not be used as such.

Pressure-demand respirator

A positive-pressure atmosphere-supplying respirator that sends breathing air to the respiratory inlet covering when the positive pressure is reduced inside the facepiece by inhalation or leakage.

Qualitative fit test (QLFT)

A test that determines the adequacy of respirator fit for an individual. The test relies on the employee's ability to detect a test substance. Test results are either "pass" or "fail."

Quantitative fit test (QNFT)

A test that determines the adequacy of respirator fit for an individual. The test relies on specialized equipment that performs numeric measurements of leakage into the respiratory inlet covering. Test results are used to calculate a "fit factor."

Respiratory hazard

Harmful airborne hazards and oxygen deficiency that are addressed in chapter 296-841 WAC, Respiratory Hazards.

Required use

Respirator use:

- That is necessary to protect employees from respiratory hazards

  or

- That the employer decides to require for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits.

Respirators

Chapter 296-842 WAC

Definitions

Respirator

A type of personal protective equipment designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

Respiratory inlet covering

The part of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source or both. The respiratory inlet covering may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

Seal check

Actions conducted by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

Self-contained breathing apparatus (SCBA)

An atmosphere-supplying respirator designed for the breathing air source, to be carried by the user.

Service-life

The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that sorbent cartridge is effective for removing a harmful substance from the air.

Sorbent

Rigid, porous material, such as charcoal, used to remove vapor or gas from the air.

Supplied-air respirator (*see air-line respirator*)

Tight-fitting facepiece

A respiratory inlet covering forming a complete seal with the face **or** neck. Mouthpiece respirators aren't tight-fitting facepieces.

Voluntary use

Respirator use that is requested by the employee **and** permitted by the employer when **no** respiratory hazard exists.

Notes

Helpful Tools

Information About Respirator Selection and Classification R-2
Using Assigned Protection Factors (APFs) for Respirator Selection R-5
Key Information About NIOSH Certified Respirators R-11
Planning for Medical Evaluations R-16

Notes

Information About Respirator Selection and Classification

Use with Chapter 296-842 WAC, Respirators

This tool provides guidance about respirator selection and classification for users who aren't familiar with these topics.

When do respiratory hazards occur?

Respiratory hazards that require use of respirators can occur during:

- Routine tasks
- Tasks that occur infrequently such as monthly cleaning of a reactor vessel or chemical storage tank
- Emergencies such as rescue, response to a chemical spill, or circumstances where employees must escape from toxic atmospheres.

Am I qualified to select respirators?

To determine this, you'll need to consider:

- The complexity of your employees' exposures to respiratory hazards and respirator use circumstances.
- If you have a suitable level of technical knowledge and experience with respirators to address respiratory hazards and use circumstances.

  For example, individuals selecting respirators solely for wood dust exposure wouldn't need as high a level of knowledge and experience as individuals selecting respirators for multiple contaminants or for highly hazardous circumstances such as emergencies.

What types of respirators are available?

All respirator types can be sorted into 2 main categories as shown.

Examples are provided to represent basic types available. Some respirator models aren't shown, such as models that combine features from both categories.

-Continued-

Information About Respirator Selection and Classification

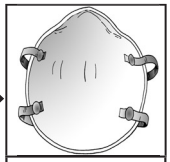
Use with Chapter 296-842 WAC, Respirators

(Continued)

Category 1:
Air-purifying respirator (APRs)

APRs use filters, cartridges, or a canister to **remove specific contaminants** such as particles, gases, or vapors, from air.

Negative-pressure APRs rely on suction (negative pressure) created during inhalation and a tight seal in order to draw air through the cartridges, canister, or filters.

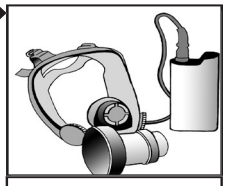


Filtering-facepiece APR

Half- and full-facepiece cartridge APRs

Mouthbit/nose clamp APR for escape-only use

Powered air-purifying respirators (PAPRs) rely on a blower, powered by a battery or other power source, to draw air through the cartridges, canister, or filters. Some models rely on a tight facepiece seal to work effectively .



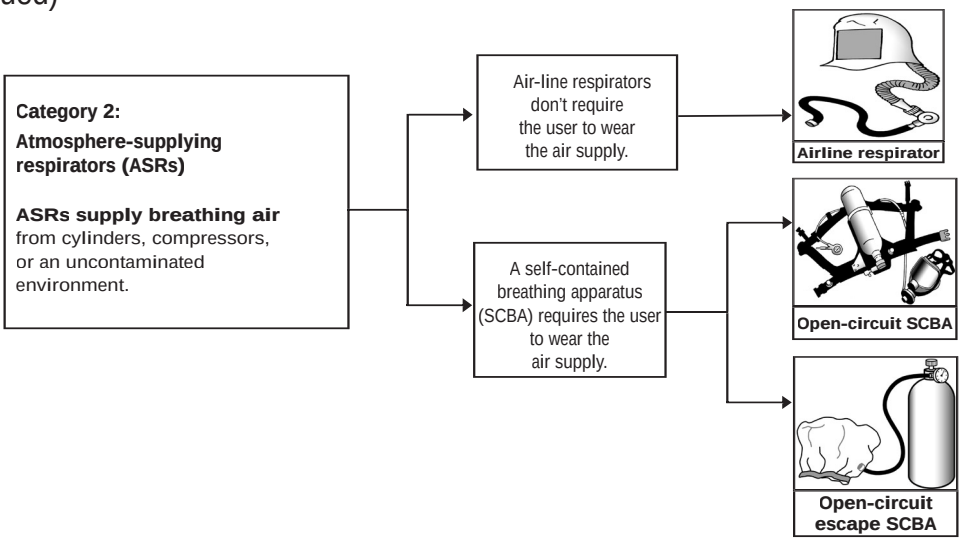
Battery-powered PAPR with a tight-fitting facepiece

-Continued-

Information About Respirator Selection and Classification

Use with Chapter 296-842 WAC, Respirators

(Continued)


Category 2:
Atmosphere-supplying respirators (ASRs)
ASRs supply breathing air from cylinders, compressors, or an uncontaminated environment.
Air-line respirators don't require the user to wear the air supply.
A self-contained breathing apparatus (SCBA) requires the user to wear the air supply.
Airline respirator
Open-circuit SCBA
Open-circuit escape SCBA

Where can I find more information about respirators and selection?

Resources include:

- OSHA's Respiratory Protection Advisor. - Visit www.osha.gov
- NIOSH's 1987 Decision Logic. - Visit www.cdc.gov/niosh
- The Centers for Disease Control and Prevention (CDC).- Visit www.cdc.gov to find information on biological agents such as TB, hanta virus, psittacosis, avian flu, and anthrax
- Respirator manufacturers' on-line selection guides and other information. – Visit www.lni.wa.gov/wisha and select the Respiratory Protection topic page to find a list of respirator manufacturers and website links
- The American National Standard for Respiratory Protection, ANSI Z88.2-1992, or most recent edition. - Visit www.ansi.org to find out how to obtain a copy or contact your local librarian for access.
- WISHA. Visit www.lni.wa.gov/wisha/consultation for a list of WISHA consultants available for assistance.
- Experienced respirator distributors, and private industrial hygiene consulting services listed in your local phone book.

Notes

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

How to use this tool:

Follow guidance in this tool if you need help using the APFs in Table 5 of Chapter 296-842 WAC, Respirators. **When you finish using this guidance, return to WAC 296-842-13005 to complete the respirator selection process.**

This tool is designed to compare hazard ratios (these are values that rate the level of employee protection **needed**, based on workplace exposure evaluation results) to APFs (these are values that rate the **expected** level of protection **provided** by different types of respirators under ideal conditions) as part of the respirator selection process specified in WAC 296-842-13005.

You can use this guidance conservatively by selecting a single hazard ratio that applies to all exposures that require respirator use. It can also be used to determine a single hazard ratio for exposures during a particular task or operation.

The steps below address exposures to a single contaminant and multiple contaminants with **separate** or **additive health effects**. The steps don't address circumstances where multiple contaminants interact to boost the toxicity of the mixture beyond the level expected from additive interactions. To find out more about this possibility, contact your local DOSH consultant.

- See www.lni.wa.gov/wisha/consultation for a list of consultants to assist you or
- Go to the Resources section of Chapter 296-800 WAC, Safety and Health Core Rules, for a list of service locations in your area.

Step 1: Start by having this information available for *each* contaminant and exposure duration of concern:

- Those *exposure evaluation results* that indicate employee exposure above a WISHA Permissible Exposure Limit (PEL) value.

Reference:

If you haven't completed an exposure evaluation, see requirements in Chapter 296-841 WAC, Airborne Contaminants.

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

- The WISHA PEL values relevant to your exposure evaluation results. These values are found in Table 3 of WAC 296-841-20020.
  - When no WISHA PEL values have been established for an airborne contaminant, use relevant available information and informed professional judgment to determine an acceptable exposure limit value to use for calculating hazard ratios. For example, you may use exposure limit values established by the American Conference of Governmental Industrial Hygienists (ACGIH).

Step 2: Substitute the values from Step 1 into the following formula and calculate separate hazard ratios for **each** airborne **contaminant** and exposure **duration** of concern.

$$\text{Hazard ratio} = \frac{\text{Exposure evaluation result *}}{\text{PEL *}}$$

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

Use this key to understand the terms used in the formula.

Table HT-1
Key to Formula symbols

The term	Is the
Exposure evaluation result	Estimated or measured concentration of an airborne contaminant for an 8-hour or other exposure period. This result comes from the exposure evaluation required by another chapter in WAC 296-841-20005.
PEL	WISHA Permissible Exposure Limit (PEL) established for the airborne contaminant. Use the PEL value (such as TWA_8, STEL, or Ceiling limit) applicable to your exposure evaluation result. PELs are found in another chapter in WAC 296-841-20020.
*	Measurement unit, such as parts per million (ppm), associated with the exposure evaluation result and PEL values. The measurement units for both values must match. Ppm is the measurement unit commonly used to express concentrations of gases or vapor. Other measurement units may be used. For example, milligrams per cubic meter (mg/ m^3) is commonly used to express particle contaminant concentrations. Contact your laboratory or your DOSH consultant if you need assistance with converting measurement units.

-Continued-

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

• If you are uncertain about this step, review Example 1:

Example 1: Calculating Hazard Ratios

You receive exposure evaluation results from the laboratory that indicate employees are exposed to a **single airborne contaminant** as follows:

300 mg/m^3 averaged over an 8-hour exposure period

600 mg/m^3 averaged over a 15-minute (short-term) exposure period

You look up the 8-hour and 15-minute WISHA PEL values for the contaminant and durations of concern. They are:

50 mg/m^3 = TWA_8 (an 8-hour limit)

150 mg/m^3 = STEL (a 15 minute limit)

Substitute the appropriate values into the formula to calculate **separate** hazard ratios for the 8-hour and 15-minute exposure. Then proceed to Step 3.

$$\frac{\text{Concentration}}{\text{PEL}(TWA_8)} = \frac{300\ mg/M^3}{50\ mg/M^3} =$$

A hazard ratio of **6** for the 8-hour exposure period

$$\frac{\text{Concentration}}{\text{PEL(STEL)}} = \frac{600\ mg/M^3}{150\ mg/M^3} =$$

A hazard ratio of **4** for the 15-minute exposure period

Note:

If your exposures of concern involve an airborne **mixture** of contaminants, **repeat this step** for each contaminant in the mixture.

-Continued-

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

Step 3: Decide which of the following applies to the exposure of concern and proceed as instructed.

- Exposure is to a **single** contaminant and you have calculated **one** hazard ratio. Skip to Step 5.
- Exposure is to a **single** contaminant and you have calculated **two or more** hazard ratios. Select the higher hazard ratio value and skip to Step 5.
- Exposure is to a **mixture** of airborne contaminants and you have determined health effects are additive. Follow Step 4.
- Exposure is to a **mixture** of airborne contaminants and you have determined health effects are **not additive**. Select the highest hazard ratio value and skip to Step 5.

Reference:

If you **haven't evaluated** the contaminants in the airborne mixture to find out if they have additive health effects, **follow the guidance** in a separate Helpful Tool, Mixtures of Airborne Contaminants, found in the Resources section of Chapter 296-841 WAC, Airborne Contaminants.

Step 4: When the contaminants of an airborne mixture have additive health effects:

- Add the hazard ratios of all additive contaminants to get a total for **each exposure duration**.
  - When you have one total, use this to represent the overall hazard ratio when completing Step 5.
  - When you have **more than one total**, select the **highest total** and use this to represent the overall hazard ratio for the exposures of concern.

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

If you are uncertain about this step, review Example 2.

Example 2: Determining Hazard Ratios For Exposures to Mixtures of Contaminants with Additive Health Effects	
Your employees are exposed to 2 contaminants at the same time (a mixture). You have followed Step 2 to calculate all hazard ratios needed and have determined that both contaminants have additive health effects as mentioned in Step 3. Add up hazard ratios as follows and select the highest total to represent the overall hazard ratio. Then proceed to Step 5.	
Hazard Ratios for the 8- hour exposure duration	**Hazard ratios for a 15-minute exposure duration**
6 (Contaminants) +9 (Contaminants) 15 (total) Select 15 to represent the overall hazard ratio	4 (Contaminants) +1 (Contaminants) 5 (total)

Step 5: Compare your hazard ratio (or overall hazard ratio) to the Assigned Protection Factors (APFs) in Table 5 of WAC 296-842-13005.

- Identify any respirator types in with an APF **at least as high** as your hazard ratio. These respirator types are capable of providing a sufficient protection level for your workplace exposures, **pending further respirator selection restrictions**.
- Continue to f**ollow other selection requirements** found in WAC 296-842-13005 of this chapter to determine your **final** respirator selection outcome.

If you are uncertain about this step, review Example 3.

Using Assigned Protection Factors (APFs) for Respirator Selection

Use with Chapter 296-842 WAC, Respirators

Example 3: Using Hazard Ratios to Select Appropriate APFs

An overall hazard ratio of 15 has been determined.

Compare this hazard ratio to the APF values shown in Table 5 of WAC 296-842-13005.

- Exclude respirator types with an APF of 5 or 10, since these values are lower than your hazard ratio of 15.
- Note respirator types with an APF of 25 or more, since their APF are higher than your hazard ratio of 15. These are acceptable for further selection consideration.
- Proceed with this information to Step 8 of WAC 296-842-13005, to continue the selection process.

Notes

Key Information About NIOSH Certified Respirators

Use with Chapter 296-842 WAC, Respirators

This tool will help you understand how to find and use NIOSH certification information.

Why is NIOSH certification important?

NIOSH-certified respirators are rigorously checked and tested to make sure they can perform well and are suitable for workplace use. These assurances don't extend to respirators that aren't NIOSH certified.

How do I know if a respirator has been NIOSH certified?

If the respirator is NIOSH certified, it'll have an approval label printed somewhere on the respirator, product box or in the user manual or other written materials contained in the box.

The label will include a "TC" number or a chart showing TC numbers that correspond to various respirator components that make up a certified assembly. In addition, important information about the respirator's capabilities and limitations for use will be included.

How do I use TC numbers?

These numbers help you identify which cartridges, airline hoses, or other respirator parts are approved for a specific respirator assembly.

When replacing parts or making repairs, make sure you select only replacement parts listed under the TC number for the assembly chosen, otherwise, you will create a non-certified respirator assembly.

Each respirator assembly has one TC number. If more than one TC number is listed on the approval label, this means more than one NIOSH-certified assembly is available.

-Continued-

Key Information About NIOSH Certified Respirators

Use with Chapter 296-842 WAC, Respirators

(Continued)

Does NIOSH certification expire?

No. However, NIOSH certification is voided when:

- Users don't follow the approval label's use specifications, including listed cautions and limitations.
- Respirator parts used aren't listed under the respirator assembly's TC number.

NIOSH occasionally withdraws certification for a respirator assembly. When this happens, a user notice is posted on their website at www.cdc.gov/niosh/respnotices.html

What do the designations N, R, and P mean?

N, R, and P are NIOSH-certification categories that apply to non-powered air-purifying respirators designed to protect against hazardous particles. They do not apply to powered air-purifying respirators (PAPRs).

You'll need to follow the use restrictions for these categories shown in Table HT-1 during respirator selection and use.

-Continued-

Key Information About NIOSH Certified Respirators

Use with Chapter 296-842 WAC, Respirators

(Continued)

Table HT-1 Use Restrictions for N, R, and P Respirator Categories	
Use	**When**
N	No oil is present in the air.
R	Oil is present, but only for a single shift or 8 hours of continuous or intermittent use. **Note:** Reuse beyond a single shift or 8 hours is **not** recommended.
P	Oil is present, but follow the manufacturer's time use limitations if you want to reuse these.

For more information about limitations and capabilities associated with these categories, see the May 2, 1997 NIOSH Respirator User's Notice, "Letter to All Users of P-Series Particulate Respirators".
Visit: www.cdc.gov/niosh

What do the designations 100, 99, and 95 mean?

These designations refer to the expected filter efficiency ratings of non-powered air-purifying respirators used to remove dusts, sprays, mists, fume, and other types of particles.

The higher the number, the higher the efficiency expected.

An efficiency rating of 95 means the filter is expected to trap 95 particles out of every 100. An efficiency rating of 100 is equivalent to that of a High Efficiency Particulate Air (HEPA) filter.

-Continued-

Key Information About NIOSH Certified Respirators

Use with Chapter 296-842 WAC, Respirators

Can I still use particulate respirators certified for "dust" or "dust, fumes and mists"?

These types of air-purifying respirators were certified under NIOSH's former certification standard, 30 CFR Part 11 (replaced by 42 CFR Part 84 in 1995), and can no longer be sold for occupational use.

Furthermore, these respirators can be used in occupational settings only when the size of the particulate contaminant(s) involved is 2 µm or larger. If the size of the particle contaminant is smaller, you'll need to use an N, R, or P series respirator instead.

Where can I find NIOSH certification requirements?

NIOSH certification requirements are found in the Code of Federal Regulation (CFR); Title 42 CFR, Part 84, Respiratory Protective Devices.

You can find this CFR, in its entirety by visiting:
http://www.gpoaccess.gov/executive.html

Planning for Medical Evaluations

Use with Chapter 296-842 WAC, Respirators

This information can help you prepare for employee medical evaluations required by Chapter 296-842 WAC, Respirators. This information doesn't apply to medical evaluation requirements found in other DOSH rules.

Who is allowed to perform medical evaluations?

Only licensed health care professionals (LHCPs) are allowed to perform these evaluations. You may use:

- On-site medical staff

  or
- Medical staff from outside services

In Washington state LHCPs include:

- Physicians
- Physician Assistants (PAs)
- Advanced Registered Nurse Practitioners (ARNPs)
- Registered Nurses

What medical questionnaire is required?

Use any of the following:

- The Medical Evaluation Questionnaire provided in WAC 296-842-22005, of this chapter.
- The OSHA Respirator Medical Evaluation Questionnaire found in Appendix C of 29 Code of Federal Regulations (CFR), Part 1910.134, Respiratory Protection.
- Questionnaires developed by other parties, such as on-line services, if these questionnaires include the same questions found in Parts 1-3 of the Medical Evaluation Questionnaire found in WAC 296-842-22005.
  - A LHCP may add questions or change the order of required questions.
  - In some cases, questions added by the LHCP before administering the questionnaire can minimize the need for LHCP follow-up.

-Continued-

Planning for Medical Evaluations

Use with Chapter 296-842 WAC, Respirators

(Continued)

Is there an alternative to using a questionnaire for employee evaluations?

Yes. You can choose to have medical examinations conducted instead of using the questionnaire, as long as you make sure the examination obtains the same information as found in the questionnaire.

Why is confidentiality important?

Aside from legal considerations, confidentiality encourages employees to provide complete and correct health information for the LHCP's evaluation. This helps make sure reliable medical evaluations are provided.

How do I maintain confidentiality during questionnaire administration?

Here are some strategies to consider when planning for evaluations:

- Make arrangements to have a LHCP administer the questionnaire at the workplace.
- Allow the employee to self-administer the questionnaire and mail it, postage paid, to the LHCP.
- Employees may use an on-line questionnaire service that meets the requirements in WAC 296-842-14005, Provide Medical Evaluations.
  - Since employees may have questions about medical issues, arrange for an LHCP to be available by telephone or e-mail during the time the questionnaire is being administered.
- If you decide to have an individual administer the questionnaire who isn't a LHCP:
  - Instruct the individual **not** to look at the employee's questionnaire at any time
  - Provide pre-addressed, stamped envelopes for completed questionnaires. Instruct employees to place their completed questionnaires in the envelope, seal it, and mail or forward it to the LHCP.

-Continued-

Planning for Medical Evaluations

Use with Chapter 296-842 WAC, Respirators

(Continued)

What if my employee can't read the questionnaire?

Find out if language translation services are needed, or if employees need help with reading.

- If **language translation** services are needed, you can use:
  - An interpreter. It's not necessary to provide a professional interpreter. Interpreters can be an individual trusted by the employee such as a co-worker, friend, family member, or the LHCP.
  - The Spanish-language version of the questionaire is in WAC 296-842-22005. Visit http://www.lni.wa.gov/ to find this version.
- If **reading assistance** is needed, make arrangements ahead of time to use an individual trusted by the employee such as a co-worker, friend, family member, or the LHCP, to assist them while filling out the questionnaire.

While making these arrangements remember to address any possible confidentiality issues that could arise.

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296-842-100 Scope.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-100, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-100, filed 10/01/03, effective 01/01/04.]

296-842-10505 Designate a program administrator.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-10505, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-10505, filed 10/01/03, effective 01/01/04.]

296-842-110 Voluntary respirator use requirements.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-110, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-110, filed 10/01/03, effective 01/01/04.]

296-842-11005 Make sure voluntary use of respirators is safe.

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-11005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-841-11005, filed 10/01/03, effective 01/01/04.]

296-842-11010 Keep voluntary use program records

[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-11010, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-11010, filed 10/01/03, effective 01/01/04.]

296-842-12005 Develop and maintain a written program.
Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-12005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-12005, filed 10/01/03, effective 01/01/04.]

296-842-12010 Keep respirator program records.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-12010, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-12010, filed 10/01/03, effective 01/01/04.]

296-842-13005 Select and provide appropriate respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-13005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-13005, filed 10/01/03, effective 01/01/04.]

Statutory Authority

296-842-14005 Provide medical evaluation.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-14005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-14005, filed 10/01/03, effective 01/01/04.]

296-842-15005 Conduct fit testing.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-15005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-15005, filed 10/01/03, effective 01/01/04.]

296-842-16005 Provide effective training.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-84216005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-16005, filed 10/01/03, effective 01/01/04.]

296-842-17005 Maintain respirators in a clean and reliable condition.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-17005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-17005, filed 10/01/03, effective 01/01/04.]

296-842-17010 Store respirators properly.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-17010, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-17010, filed 10/01/03, effective 01/01/04.]

296-842-17015 Inspect and repair respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-17015, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-17015, filed 10/01/03, effective 01/01/04.]

296-842-18005 Prevent sealing problems with tight-fitting respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-18005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-18005, filed 10/01/03, effective 01/01/04.]

296-842-18010 Make sure employees leave the use area before removing respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-18010, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-18010, filed 10/01/03, effective 01/01/04.]

296-842-19005 Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-19005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-19005, filed 10/01/03, effective 01/01/04.]

296-842-20005 Make sure breathing air and oxygen meet established specifications.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-20005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-20005, filed 10/01/03, effective 01/01/04.]

296-842-20010 Prevent conditions that could create a hazardous breathing air supply.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-20010, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-20010, filed 10/01/03, effective 01/01/04.]

296-842-20015 Make sure compressors don't create a hazardous breathing air supply.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-20015, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-20015, filed 10/01/03, effective 01/01/04.]

296-842-21005 Keep labels readable on respirator filters, cartridges and canisters during use.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-21005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-21005, filed 10/01/03, effective 01/01/04.]

296-842-22005 Use this medical questionnaire for medical evaluations.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-22005, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-22005, filed 10/01/03, effective 01/01/04.]

Statutory Authority

296-842-22010 Follow these fit-testing procedures for tight-fitting respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-22010, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-22010, filed 10/01/03, effective 01/01/04.]

296-842-22015 Follow procedures established for cleaning and disinfecting respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-22015, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-22015, filed 10/01/03, effective 01/01/04.]

296-842-22020 Follow procedures established for seal checking respirators.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-22020, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-22020, filed 10/01/03, effective 01/01/04.]

296-842-300 Definitions.
[Statutory Authority: RCW 49.17.010, .040, .050, and .060. 07-05-072 (Order 06-39), § 296-842-300, filed 02/20/07, effective 04/01/07. Statutory Authority: RCW 49.17.010, .040, .050, and .060. 03-20-114 (Order 02-12), § 296-842-300, filed 10/01/03, effective 01/01/04.]